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# The Mining Journal

LONDON, SEPTEMBER 16, 1960

Vol. 255. No. 6526.

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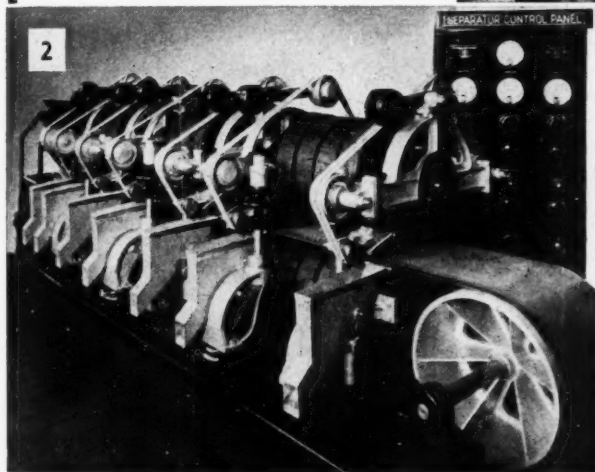
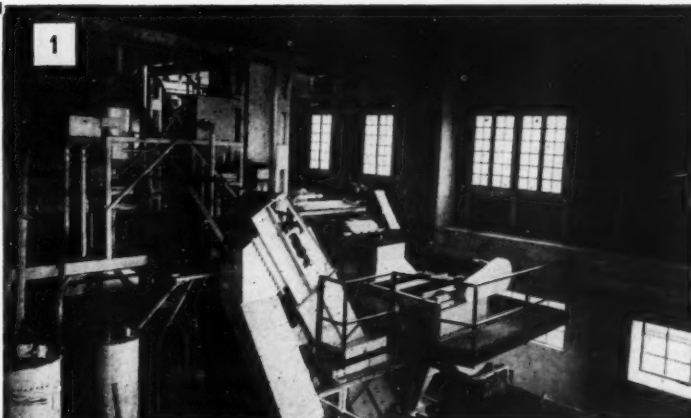
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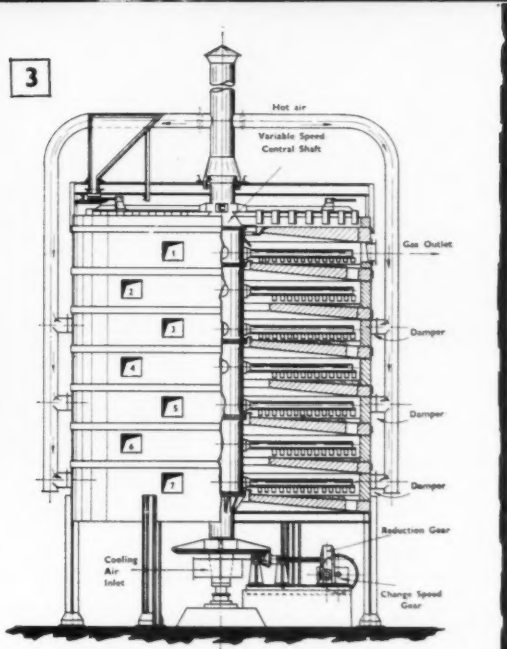
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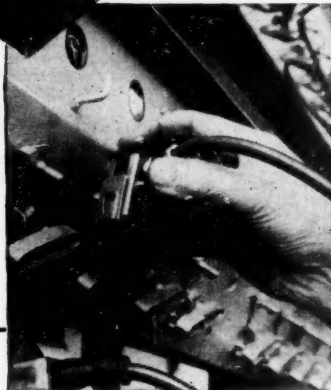
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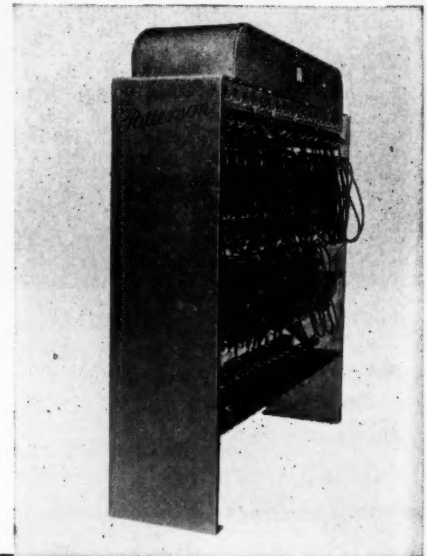


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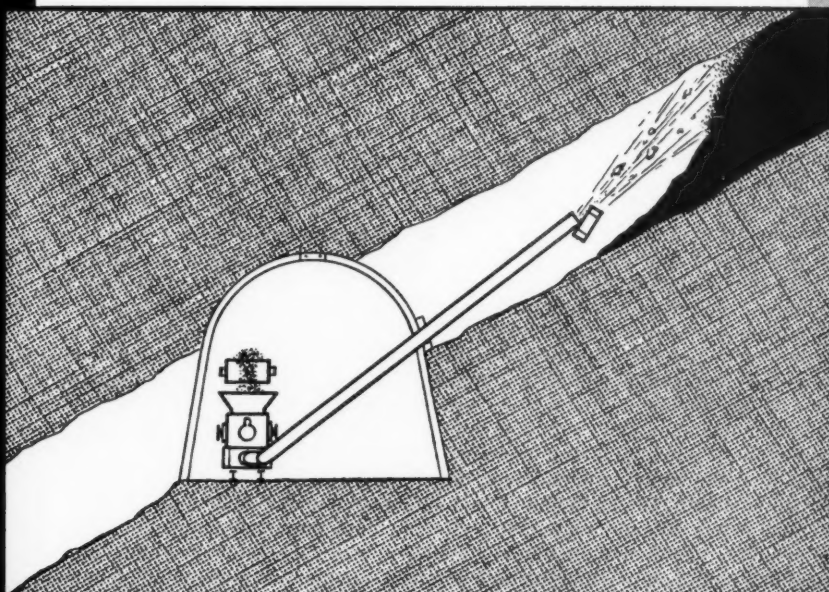
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# The Mining Journal

London, September 16, 1960

## In this issue . . .

Has Copper Reached its "Floor"?	303
Tin Smelter for Nigeria	304
Czech Minerals Progress	304
Haiti's New Concentrator Starts Up	305
Steel Industry for New Zealand	305
How Much Tin is Russia Producing?	306
Power Station to Take Coal Straight from Pithead	307
Cutting Evaporation Losses on Reservoirs	308
Mining Progress in Bulgaria	309
Twenty-First Geological Congress	312
Mining Miscellany	313
Machinery and Equipment	314
Metals and Minerals	316
London Metal and Ore Prices	316
Mining Finance	318
Company Meeting	319
Rand and Orange Free State Returns for August	319

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## Has Copper Reached its "Floor"?

"COPPER prices may fluctuate," said Mr. D. McIntyre, Minister of Finance of the Central African Federation, when delivering his budget speech earlier this year, "but it does not seem over-optimistic to envisage a price of £220 to £240 per ton for some time to come. If this could be achieved at about a level of £240 per ton, it would be a source of great satisfaction to the Federal Government and our capacity for producing copper will rise".

So far, copper prices have remained well within these limits, despite the persistent rise in world stocks, which at the end of July, 1960, stood at 277,896 tons. The August figures will almost certainly show a further overall increase. But for the existence of three serious threats to copper supplies, these heavy stocks, together with the growing reserves of the producers themselves, would unquestionably have brought prices down to well below their present levels, assuming that production had continued at the present rate.

The three major uncertainties that have been causing sellers to hold off the market were the wage disputes in Chile and Northern Rhodesia and the crisis in the Congo, any one of which was potentially capable of transforming the outlook of supplies. One of these threats has been eliminated by the successful outcome of the negotiations in Northern Rhodesia between the Chamber of Mines and the African Mineworkers' Union. The possibility of a stoppage at Chuquicamata can certainly not be excluded, however, for Anaconda has so far made no counter-proposals to the union's demands for increased salaries and other benefits. Anaconda's formula, which has been accepted in principle by the union, refers exclusively to the classification of "blue trouser" workers. In other respects the two parties appear to be as far apart as ever. The Copper Workers' Confederation has stated that, if no definite agreement is reached by September 20, it will seek legal authorization to strike immediately following expiration of the contract on September 30.

As for the Congo situation, the mines of Union Minière are reported to be operating at almost full strength and all their shipments are now being routed through Lobito or Beira. Nevertheless, there can be no assurance that production will not be subject to further disruption until stable government has been restored to the Congo and, in particular, until the future of Katanga has been peacefully settled.

It is noteworthy, however, that world copper stocks are now greater than the Belgian Congo's entire 1959 output of 275,000 tons, thereby providing consumers with ample protection against the immediate consequences of any new crisis in the Katanga or a prolonged standstill at Chuquicamata. Failing either of these possible setbacks, the present level of consumer demand is scarcely large enough to prevent a sharp fall in the L.M.E. prices from taking place, though Russia remains a likely, if unpredictable, buyer at any favourable market opportunity.

On the other hand, it can scarcely be doubted that, but for the uncertainties overhanging the market, a number of major producers would already have cut back their outputs, as they did with such conspicuous success in 1958.

In his statement to shareholders of Nchanga, Mr. H. F. Oppenheimer emphasized that, if the need again arose, the company would be prepared to join with other producers in either reducing output or withdrawing copper from the market, and similar views have been expressed elsewhere. It seems improbable, however, that any of the copper companies will make any definite cut backs in production until the end of this month, when they will know which way the Chuquicamata cat is going to jump.

Meanwhile, one of the major copper mining companies understood to be Rhodesian Selection Trust, has intervened on the London market, where it has been a heavy buyer during the past fortnight, taking up to 1,000 tons of metal a day but early this week buying appeared to have slackened. The reason for this unexpected market support has been a matter for speculation. The most probable explanation seemed to be that it was in the nature of a holding operation, undertaken by R.S.T. either on its own account or with support from other producers. This seems to be confirmed by the joint statement issued this week by Anglo American and R.S.T. that copper production cuts are being considered. The present over-supply position demands most careful consideration, it was stated, and discussions are now going on between the two groups on this question.

Meanwhile, it seems to be a fair assumption that producers generally would be reluctant to see prices fall below R.S.T.'s offered price of £235-£236 a ton.

Whether the balance between supply and demand is effected through cutbacks introduced by individual producers, or as a result of circumstances beyond control, the copper industry can scarcely fail to benefit, in the long term, from the very comfortable stock position which, thanks to the uncertainties overhanging the market, has been built up without any critical effect on prices. It has become increasingly apparent that the persistence of a backwardation in times of uncertainty and stress, which virtually eliminates hedging, can only be avoided by the maintenance of adequate stocks within convenient shipping distance of the plants of consumers trading on the L.M.E.

Now that producers, on the one hand, are becoming increasingly conscious of the desirability of tailoring output to demand, while on the other hand world stocks are large enough to avert any danger of recurring shortages, the copper industry should be able to look forward to the more stable price conditions which are its greatest need. Had this situation not been in accordance with the wishes of the producers themselves, action would obviously have been taken in time to prevent stocks from rising to their present level. As it is, the industry now has an invaluable buffer stock which, unlike that of the International Tin Council, has been built up without formal organization or any calls on producers for special contributions in cash or kind.

The short-term outlook is clouded to some extent by the uncertain economic prospect in the United States. For the time being, however, the era of very big increases in production capacity is over, and in the next three years, 1961-1963, further expansions may run to over 70,000 tons a year, giving an average increase of about 2 per cent, whereas copper usage, over the years, usually grows faster than this. In this connection it is noteworthy that a recent survey, undertaken by the Business and Defence Services Administration, indicated that in the U.S. copper use in the communication industry had increased by 66 per cent since 1952.

The fact that consumers are effectively insulated against future contingencies should itself give a further impetus to copper usage. While it is evident that for several years ahead there will be more than sufficient copper available to satisfy future needs, the problem of surplus production should soon be of diminishing importance as a market factor.

Looking further ahead, the importance of maintaining sufficient surplus capacity remains as great as ever. In the aluminium industry the policy of the major producers is to keep capacity some years ahead of demand. This is no less necessary in the case of copper—otherwise we should soon find ourselves faced once again with those alternating conditions of scarcity and abundance which have been copper's greatest enemy in the past.

### A TIN SMELTER FOR NIGERIA

At the annual meeting of Consolidated Smelters Ltd. the chairman, Mr. Clifford Waite, announced a decision to install a tin smelting plant on the Jos Plateau in Northern Nigeria and to form a company in Nigeria for that purpose.

Coming as it did on the eve of Nigeria's attainment of independence on October 1, this announcement could scarcely have been more appropriately timed. The step has been taken in accordance with the Government of Nigeria's expressed desire for a domestic smelter to be erected for the treatment of locally produced concentrates. As Mr. Waite points out, Portuguese interests are also proposing to set up a smelter in the country. Hitherto the Nigerian production has been sold under contract to Williams Harvey and Co., a subsidiary of Consolidated Tin, and treated at the Bootle smelting works, near Liverpool.

Last year, due to restrictions exports amounted to 5,500 tons (metal content), but in the period 1952-1957 it ranged from 8,000 to 9,500 tons, the latter figure being reached in 1957.

We have frequently had occasion in recent years to refer in this journal to the very understandable desire of emergent countries to encourage the establishment of local industries by exporting their raw materials in processed form. Such aspirations are bound to have widespread repercussions on the future pattern of the metal industries throughout the world. In acceding to the Nigerian Government's request, Consolidated Tin Smelters have shown a realistic appreciation of this particular wind of change.

### CZECH MINERALS PROGRESS

The Czech Communist Party has announced a new list of minerals production figures for the national mining and processing industries. Over the first half of the current year, it is stated, the industrial production plan was filled to 101.3 per cent, output being higher by 11.8 per cent than that for the corresponding period of last year. This half-year's output included 14,900,000 tonnes of hard coal, 26,930,000 tonnes of brown coal and 2,290,000 tonnes of pig-iron, this latter figure being 11.2 per cent above that for the 1959 period. Raw steel output rose by 10.5 per cent over the period. Over the whole of last year Czech lead production stayed at 1958 levels, with 6,000 tonnes mined production (lead content) and 9,000 tonnes furnace lead.

Great stress is to be put on mined materials in the coming 1961-1965 Five Year Plan. Within this plan copper production is to be raised by 55 per cent, that of primary aluminium by 51 per cent, lead output by 14 per cent and zinc output by 111 per cent. In addition, the output of iron ore is to go up to at least 4,400,000 tonnes by the target year. Nickel production from Albanian ores and indigenous ferro-nickel ores is to be resumed over the period.

The country's ferrous metals industry will receive much attention under the Five Year Plan and mainly for this reason a target of 11,600,000 tonnes of coke—138 per cent the 1960 production—has been set for 1965. The main project is the East Slovakian Ironworks at Kosice, while considerable expansion and modernization is planned for the big ironworks combine near Ostrava, the Ostrava New Steelworks (a separate concern), the Trinec Ironworks and the Tube-Rolling Plant and Ironworks at Komotava. Working productivity is to increase by 41.3 per cent over the 1961-1965 period. By the target year production of 7,700,000 tonnes of pig-iron (163 per cent 1960 output), 10,600,000 tonnes of raw steel (157 per cent 1960), 7,300,000 tonnes of rolled steel (162 per cent) and 912,000 tonnes of steel tubes (141 per cent) is planned.

In connection with this increase in metals production, coal production is planned to reach 70,200,000 tonnes of brown coal and 31,400,000 tonnes of hard coal by 1965. To start after the end of the plan period is exploitation on a large scale of coking coal from the Paskovo deposits in the Ostrava coalfields. Production from this site, the reserves of which are said to be "several hundred million tonnes", will start on January 1, 1966.

#### HAITI'S NEW CONCENTRATOR STARTS UP

Initial tune-up of the 1,500-ton daily capacity concentrator of Consolidated Halliwell Ltd. has commenced in the Republic of Haiti. Financed by Consolidated Mogul Mines Ltd. and erected by Denver Equipment Co. Ltd. (London, England), the new plant will be pushed steadily until it exceeds its rated capacity by over 500 tons daily.

Original expectations of a 35 per cent to 40 per cent copper concentrate have been far exceeded, President Wm. Plexman told the Canadian representative of *The Mining Journal*. Initial concentrates averaged 46.82 per cent copper, 8.62 oz. silver and 0.40 oz. gold per ton.

The first 750-ton daily capacity ball mill and complete circuit is currently treating in the neighbourhood of 600 to 700 tons daily. The second unit approaching production and by the time the third unit is operative output should be pushed beyond the 2,000-ton per day rate.

The heavy disposition of bornite found underground, in preparation of stopes, is expected to raise average mill-heads well above the average of original drill estimates of the orebody which ran 2.4 per cent copper, plus about \$1 per ton combined silver and gold. As an example, the average of all development rock during July was 3.08 per cent copper.

Current mill feed is being drawn from the 30,000-ton stockpile, on surface, and from stoping on the 1,330 adit level and from the main production level at 1,500 ft. above sea level. The No. 3 adit, at 1,150 ft., will be mined later while the 1,700 level, accessed from the internal shaft, is in the course of development. Stopes will be available for production at a later date.

Outside straight mining and development and surface construction, the only exploration being conducted at this date is testing the merits of ground lying beyond the main orebody on the north-west of the mine. Marked encouragement has been received from underground diamond drilling in testing this area. Work completed so far has suggested a new ore limb coming in with grade somewhat similar to that realized in drilling off the original Meme orebody.

As could be expected, the work of Denver Equipment and that conducted by Consolidated Halliwell's Haitian subsidiary, Sedren S.A., have literally transformed the Terre Neuve Valley of the Republic. The steep tree-dotted hills have been introduced to the modern Canadian mining "know-how" and the foothills have sprouted a modern copper plant, ancillary equipment and residences for personnel that would be hard to beat in the modern mining camps of Canada's vast billion dollar mining industry.

It is estimated that the first copper concentrates from the Republic of Haiti will be moving from the company's dock facilities at the Port of Gonaives sometime in October. Concentrates have been purchased, under contract, by Philipps Ore Corp., New York.

Water for milling, once considered a major obstacle, is now in ample supply by the simple measures of collecting rainfall in a reservoir above the mine. At the last report about 25,000,000 gal. had been built up behind the dam.

Exploratory drilling from the 1,330 and 1,500 levels has returned such new ore sections as: 3.4 ft. of 5.58 per cent copper; 5 ft. of 1.63 per cent copper and 6.6 ft. of 2.60 per cent copper; 10 ft. of 5.35 per cent copper and 20 ft. of 3.30 per cent copper; 1 ft. of 7.90 per cent copper, followed by 4 ft. of 1.47 per cent copper and 5.4 ft. of 14.90 per cent copper; 22.3 ft. of 12.92 per cent copper. An earlier hole on the 1330 level returned 60 ft. of 2.86 per cent copper in the new ore area.

New ore indicated this year has not been recalculated to reserves which stood as primary and proven at December 31, 1959, at 2,422,350 tons averaging 2.33 per cent copper.

#### STEEL INDUSTRY FOR NEW ZEALAND

The project for an iron and steel industry in New Zealand is developing. The proposal is to use the very extensive deposits of titaniferous iron sand on the west coast beaches, a project which has attracted attention for a number of years. More than 50 years ago, smelting was carried out by the Onekaka Iron Co. but without success, and since then nothing further has been done until recently. Private interests investigated the project, and a proposal was considered for a joint operation by the New Zealand Government and private organizations. This proposal failed because of the impossibility of reconciling the conflict of interests between the proposed private participants.

The government has now decided to undertake the venture itself. A steel industry investigation company will be established immediately with a capital of £N.Z.250,000, as a state enterprise. Previous plans provided for a 49 per cent participation by private interests, but the new plan gives the state full control. The company will investigate the potential of the iron and steel industry, based on the iron sands. If the outcome is satisfactory, it is indicated that the ultimate operating company will need a capital of some £30,000,000, in the provision of which private interest could take part.



# How Much Tin is Russia Producing ?

**A**LL figures concerning Soviet tin production during the post-war period are only estimates. It appears that the American estimates for 1950 are similar to mine (i.e., about 12,000 tonnes a year). For the two subsequent years, 1955 and 1960, however, our estimates diverge considerably. The American statistics indicate an almost complete standstill in Soviet tin production during the past decade, which is contrary to the information available about the development of this industry.

I use Soviet sources only; that is, the information published in their daily Press or their specialized periodicals and technical books. From a thorough study of this material, I have collected the following facts:

(a) During these ten years, especially during the 1950-1955 period, the Soviet tin industry has been expanding rapidly.

According to Soviet official statements, their tin production has been increasing as follows:—

1950—2.7 times more than in 1945.

1955—80 per cent more than in 1950.

By 1960, it has been planned to increase the 1955 production level by 55-60 per cent.

(b) During this period, several new tin ore deposits have been discovered in the old and the new regions, new mines and new ore processing plants have been commissioned—some of them rich and easily exploitable.

## Regional Developments

Taking region after region, we can describe the developments of the Soviet tin industry thus:—

(a) In the Transbaykal region, all the tin mines have been substantially enlarged and are over-fulfilling their plans.

(b) In the north-eastern region of Kazakhstan, the tin mines in the Kalbinskiye Mountains and the tin smelting plant at the Leninogorsk plant have considerably increased their production. (Kazolovo Trust.)

(c) In the Mayli Khingan area (Khinganolovo Trust), the Mikoyanovsk tin mines and ore processing plant, the construction of which started in 1946, were fully commissioned by 1950, when a second ore processing plant was built on Sopka Otvetnaya and further tin mines have been opened in these mountains. In 1958, their tin production was exceeding the plan by 18 per cent.

(d) In the Primorye region, the numerous tin mines and ore processing plants have been developed considerably during the past ten years. Today, the Khrustalnyi combine, Sikhali combine and the Dalolovo combine are considered as the most advanced tin mines in the U.S.S.R. Mining specialists from all over the country visit these mines to study the technical methods being used there.

By Jan Kowalewski

(e) In 1958, in the Khabarovsk Kray, the construction of a large tin combine began at Solnechnoye (35 miles west-north-west from Komsomolsk). This is one of the biggest and richest tin deposits in the U.S.S.R. and is to be exploited mainly by opencast methods, producing the cheapest tin in the whole of the U.S.S.R.

(f) In Yakutya, very large tin ore deposits have been discovered in the valley of the river Yana. Three clusters of deposits are known there: the northern cluster at Deputatskoye, the central cluster at Ege Khaya and Kester; and the southern cluster around Burgochan. At present, tin ore is mined and processed in two regions only: at the Ege Khaya tin combine, which started to work in 1939, and at Deputatskoye tin combine, which began work in 1951 and has since expanded very considerably. For the year 1960 alone 15,000,000 roubles have been earmarked for its expansion. Its ore reserves are enormous, several deposits are still to be opened up, and the production of this cluster is to be doubled during the present Seven Year Plan. At present, the tin ore concentrate produced at Deputatskoye is the cheapest in the whole of the U.S.S.R.

(g) In the Magadan Oblast, there has been a considerable development in the tin industry during the last decade. There is one tin mining centre on the river Kolima. On Chukotka there are at least two tin ore mines on

In a table of estimated non-ferrous metals production in the U.S.S.R., compiled by Lt.-Col. Jan Kowalewski which appeared originally in "Optima" and was reproduced in our issue of April 1, 1960, p. 382, Russian tin production in 1955 is placed at 21,600 tonnes and the projected 1960 output at 35,000 tonnes. These tonnages are higher than the outputs estimated by leading American specialists. Col. Kowalewski believes, however, that the American figures on Soviet tin production during the past ten years (1950-1960) are too low. He maintains that, for the reasons here set out, his own estimates are probably nearer the mark



Chaunskaya Bay, near the port of Pevek. Furthermore, in 1959, a very large tin combine, including mines and ore processing plant, was commissioned at Yultin. The latter is connected with the port of Egvekinot by a newly constructed road 200 km. in length.

#### Considerably Increased Production

These facts indicate that during the 1950-1960 period, the production of Soviet tin concentrates must have increased considerably and it would be logical to assume that the production of metal followed this trend, in accordance with the percentage figures published by the Soviet authorities.

Very little is known about Soviet tin smelting. During the war, the tin smelting plant at Podolsk (near Moscow) was evacuated to Novosibirsk, where a new and large tin

smelting plant was already under construction. The Podolsk plant was not rebuilt after the war and the plant at Novosibirsk became known as: "The Central Tin Smelting Plant in Novosibirsk".

There is only one other known tin smelting plant. This is in the Leninogorsk lead and zinc combine. There is also a secondary tin refinery in Ryazan.

All tin concentrates from ore processing plants are being sent for re-processing to a central plant called: "Skopinskiy Dovodcheskiy Zavod". This plant is situated at Skopino, a small town some 100 km. south of Ryazan and 230 km. south-east of Moscow.

The Novosibirsk tin smelting plant has been thoroughly reconstructed and enlarged since the war. Its tin refining methods have been improved considerably.

The truth about Soviet tin production probably lies somewhere between my figures and those of the Americans, but I think much nearer mine than theirs.

## Power Station to Take Coal Straight from Pithead

**A** GECROFT "B" power station, at present supplied with fuel by lorry from distant parts of the Lancashire coalfield, will next year have its coal delivered by conveyor belt from a new colliery across the road—eventually, perhaps, as much as 2,000 tons a day will be transferred.

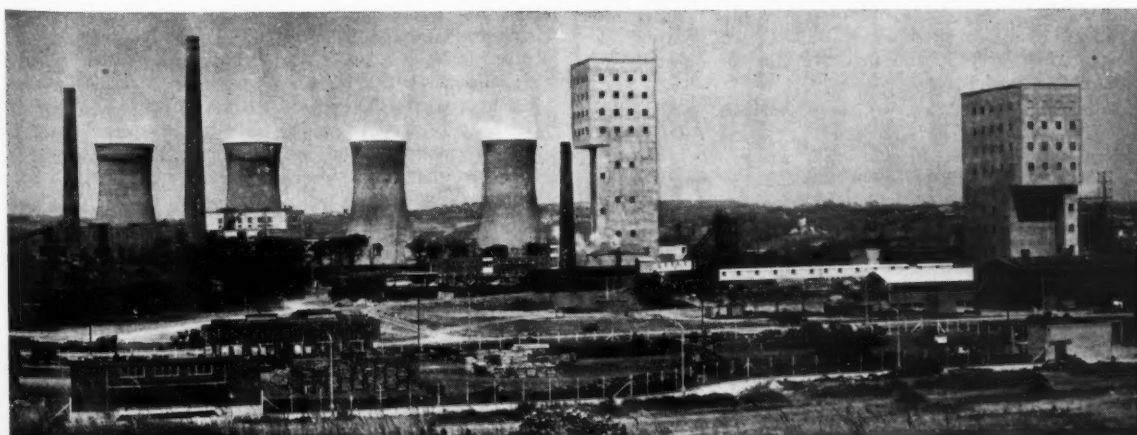
The new Agecroft Colliery, a £9,000,000 pit of the North Western Division, National Coal Board, is being constructed on the site of an old working, and at present not much more than 1,000 tons of coal a week are being produced; but when it comes fully into service in 1962, its daily output will approach 4,000 tons. After processing

in the coal preparation plant, coal will be delivered by conveyor belt to the power station.

Only men, and material used for stowing underground, are being wound in the new No. 5 Shaft, but eventually it will be used for coal winding as well. The four-deck cage in this shaft holds 144 men, and at a winding speed of 41.7 ft. per sec., 528 men can be brought to the pithead from a depth of 1,925 ft. in half-an-hour.

The friction winder in this shaft is driven by a 2,500-h.p., 530 r.p.m. motor, supplied by Associated Electrical Industries Ltd., which takes its direct-current from grid-controlled mercury-arc rectifiers—the first installation of this type in Lancashire.

When the coal preparation plant is ready, later this year, coal from Agecroft Colliery (N.C.B. North Western Division) will be delivered directly to the neighbouring power station by conveyor belt. In the centre of the photograph is No. 4 Tower, housing a 2,500-h.p. AEI skip winder which will be commissioned shortly for raising coal. No. 5 Tower (right) accommodates another AEI 2,500-h.p. winder at present in service for winding men and materials



# CUTTING EVAPORATION LOSSES ON RESERVOIRS

**I**N large areas of the world loss of water through evaporation far exceeds consumption—a phenomenon which is only too well-known to mining companies operating in arid areas. In parts of Australia, for example, the annual loss may be four times the consumption and in some areas during droughts water often has to be carted many miles at a cost varying from £2 to over £10 per 1,000 gallons. In parts of Africa the useful consumption may amount to only one-tenth of water collected and when the supply is exhausted, no alternative remains but for whole communities to migrate.

## C.S.I.R.O.'s Work on Evaporation Control

For the last twenty years Australia has made the pace in developing methods of reducing evaporation, claims Mr. W. W. Mansfield, of the C.S.I.R.O. By the standards of European-cultured economic geographers, 80-90 per cent of Australia is classed as an arid region, but sheep and cattle are grazed in these arid regions and extensive mineral deposits are worked. The incentive for work on water conservation in all its forms is therefore great. Reduction of evaporation is but one aspect of Australia's work in this field. To illustrate the need for this work, it can be stated that one of Australia's most valuable mining areas, Broken Hill, has an annual rainfall of about 7 in. and an annual potential evaporation loss of about 8 ft.

C.S.I.R.O.'s work on evaporation control began in late 1952, with a reassessment of work done by the late Professor Heymann and by Dr. Yoffe in the late 30's at Melbourne University. A number of fundamental principles relevant to the successful use of monomolecular films for reducing evaporation have since been developed, and a considerable number of experimental tests have been conducted on both large and small water storages. Throughout this work the utmost support was received from water authorities, from mining companies and from producers of long-chain alcohols.

Laboratory work between the wars proved that a film could be spread from cetyl alcohol which would cut evaporation losses, but no practical use was made of this knowledge until 1953 when field trials were begun by Mansfield in Australia. After two years' work he evolved a method of saving water in small dams of up to two acres. This required beads of cetyl alcohol confined in rafts floating on the water surface. The beads have to meet rigid specifications and are produced only by the British firm of Price's (Bromborough) Ltd. C.S.I.R.O.'s certificate of approval, the SI-RO-SEAL, was awarded to their product in 1956 and they are still the only manufacturers to hold it.

Mansfield next turned to large reservoirs and during six weeks in 1957 he succeeded in saving 200,000,000 gallons of water at Broken Hill, using cetyl alcohol dissolved in a volatile petroleum solvent. Seeking a more efficient and cheaper method of filming large reservoirs, C.S.I.R.O. carried out field trials using a new dusting technique. This process has been tested for 12 months at Umberumberka Reservoir (250-300 acres) supplying Broken Hill in New South Wales and at Lake Corella (approx. 1 sq. mile in area) which supplies the Mary Kathleen Uranium Mines in Queensland.

The process involves covering the water with an invisible film formed from a cetyl-stearyl alcohol blend. The material is applied as a fine powder from a dispenser mounted in a boat. Usually development of the film is

Progress in water conservation methods was reviewed at a reception held by Price's (Bromborough) Ltd., in London on September 6. Among the speakers was Mr. W. W. Mansfield of C.S.I.R.O., Melbourne, Australia, who developed the raft process which bears his name and who has recently been working with other C.S.I.R.O. scientists on the powder method of applying the film

assisted by traversing the storage across-wind. The losses of film and powder are replenished by further treatment. The interval between treatments depends upon conditions, and usually varies between one and three days. The need to re-treat a surface is manifest when the characteristic smooth appearance of a film-covered surface begins to disappear.

In the early experiments, carried out by R. G. Vines of C.S.I.R.O. Chemical Research Laboratories, agricultural dusters were used as dispensers. An improved dispenser came with the development of a grinder-duster by Mr. C. S. Robertson of the Broken Hill Water Board. This machine consists of a rotating brush which shreds blocks of cetyl alcohol and blows the fine powder on the water. The machine is simple to operate and can easily be mounted in a small boat.

In all experiments a commercial cetyl-alcohol blend (Grade A.31 from Price's) was used. At Umberumberka Reservoir the dosage rate for the first few days was 30 lb. per day. Subsequently the rate was reduced to less than 10 lb. a day.

In light winds up to 5 m.p.h., savings of up to 50 per cent were achieved, but at high wind velocities reductions in evaporation were meagre. The process is recommended for regions of low wind velocity and for storages greater than about 150 acres.

## Price's Investigations

As one of the largest manufacturers of fatty acids and fatty alcohols in Europe, Price's became interested at an early stage in the work being carried out on the use of fatty alcohols to reduce the rate of evaporation from water surfaces. Since the need to conserve water is a world problem, the company has devoted considerable time and energy to its study on an international basis. Field work by its members is backed by the tremendous resources of its parent company, Unilever.

In July and August, 1957, Price's carried out field work for Rio Tinto Mines in Spain. Using cetyl alcohol dissolved in volatile white spirit spread from two large floating dispensers, they saved 35 per cent of the evaporation loss at a cost of 13d. per 1,000 gal. In the same year the company presented a paper on water conservation at the 2nd International Congress of Surface Activity and produced another for *Research*.

In 1958, Rio Tinto Mines carried out further field work in Spain, but on Price's advice the solvent was changed to kerosene. On their 31-acre reservoir the evaporation loss was cut by 31 per cent and the cost involved reduced to 7½d. per 1,000 gal. On that occasion the solution was applied from a number of shore-based dispensers.

Later that year Price's collaborated with the East African Meteorological Department in field trials in Kenya and Tanganyika and participated in consultations in Uganda and the Sudan. Attempts were made to apply the knowledge gained in Spain to filming operations in East Africa.

The Mansfield process was tried but proved to be unsuitable. The water was heavily contaminated with bacteria which coated the beads, preventing them from giving off the film, while the rafts were damaged by animals and birds as well as by Africans, who broke them open to investigate the contents. This worker, too, turned to the solvent application method using kerosene as the solvent. On one 1 acre reservoir he saved 20 per cent of the water normally lost by evaporation, while on another reservoir of five acres the saving was 30 per cent.

East African experiences spotlighted the urgency of research into two problems; an alternative to the Mansfield process for filming small reservoirs and the effects of wind on the film.

After prolonged research and testing, Price's succeeded in developing a system for the simple and continuous treatment of small storages and patent application has been made. Six units are now awaiting trial under field conditions in East Africa and arrangements are being made for similar tests to be carried out in Australia by C.S.I.R.O. Once the final field work has been completed, it is planned that packs containing the cetyl alcohol charge, together with the constant feed device, will be marketed through Price's agents overseas at a cost estimated at 10s.

The company has also been carrying out experiments on large water surfaces. Because the problems were basic and not dependent on tropical conditions they could be studied in the U.K. Through the co-operation of the British Aluminium Co. Ltd. and the Ardverikie Estates Ltd., Price's were able to carry out experiments at Loch Laggan, in Inverness-shire. The results obtained, it is hoped, will be a major step forward in the development of a satisfactory filming technique. Studies of the effect of wind on the film have demonstrated that it is possible to estimate for certain given conditions the minimum rate at which cetyl

alcohol should be applied to the water to maintain effective film coverage.

This research has also provided evidence that the rate of film movement relative to the wind is not constant, as has always been believed, but accelerates progressively.

The efficiency of various solvents for the solution application method of producing the film has also been studied at Laggan. The results show that in terms of efficiency, availability and cost, kerosene—the cheapest—is the best.

Methods of applying the film have also been studied. The results show that, while under certain conditions the recently-developed powder-dusting process is most effective, there are cases where the use of a kerosene solution will provide better results.

It has always been the company's policy to make its results freely available by submitting papers to scientific bodies, as well as through trade journals, by its own technical publications, and by issuing individual reports against specific enquiries. This week Mr. I. K. H. McArthur, of Price's will be delivering a paper entitled "Fatty Alcohols for Water Conservation, Part II" at the 3rd International Congress of Surface Activity at Cologne.

Last December, following a request from the International Commission on Irrigation and Drainage on behalf of UNESCO, the company produced a report on control of evaporation losses from water surfaces for the British section of the Commission. This was well received by the Indian headquarters of I.C.I.D. and since then experimental and bulk supplies of cetyl alcohol have been sent to a number of authorities in India for research.

Research on water conservation is also being carried out in the U.S., where the tendency is to use particles of cetyl alcohol mixed with water.

## MINING PROGRESS IN BULGARIA

STATISTICS released at the end of July by the Bulgarian official Bureau of Statistics indicate that, in general, the mining and metal industries exceeded their targets for the first half of this year. Actual outputs, with percentage increases over the 1959 figures, included:

	Output (tonnes)	% of 1959 Output
Coal	8,347,000	113
Pig iron	55,000	103
Steel	120,000	106
Copper Concentrate (20 per cent Cu.)	33,000	121
Lead Concentrate (70 per cent Pb.)	56,000	101
Zinc Concentrate (52 per cent Zn.)	55,000	103
Copper (electro)	6,000	145
Lead	20,000	112
Zinc	7,000	230

The fact that, with the exception of zinc, the targets have only narrowly been exceeded, in contrast with the high percentages in which they are over-achieved in some other countries in the Communist bloc, is due probably to more reliable statistical services, which have made it possible for Bulgaria, as well as, for example, Czechoslovakia, to estimate more accurately what is feasible and hence to set the targets on a more realistic basis.


Despite the satisfactory results of the first half year, the performance of the mining industry has not been immune

from criticism. A few weeks ago *Rabotnichesko Delo*, the daily organ of the Bulgarian Communist Party, carried an editorial drawing attention to certain shortcomings in metal mining. Attention was drawn to the danger that new flotation plants approaching completion—for example, the plant at Izdremets, near Eliseyna which constitutes part of the Georgi Dimitrov lead-zinc mining complex in the Rhodope mountains—might find themselves under-employed for lack of an adequate supply of ore. Whereas at the Strashimir mine, a record had been set up by the driving of 270 m. of horizontal gallery in 35 days, and well organized teams were averaging 100-150 m. a month, elsewhere, owing to defective organization only 20-30 m. a month were being achieved. At one mine in the Georgi Dimitrov complex, drastic measures were required if the year's target of 1,550 m. of horizontal galleries was to be reached, since only 325 m. had been achieved in the first five months.

According to a report published recently by the official Bulgarian Telegraphic Agency, Bulgaria now holds first place in the Balkans in respect of iron ore reserves, now estimated at 300,000,000 tonnes, and of lead-zinc ore (112,000,000 tonnes), besides having coal reserves estimated at 1,340,000,000 tonnes. *Otechestven Front*, the official daily organ of the governmental coalition known as "The Fatherland Front", reports that the Five-Year Plan for the development of non-ferrous metal ores has been achieved in a year and a half, this being attributed to extensive mechanization and automation in the non-ferrous ore mines since 1953.



# SWEDISH LADDER



## New drifting technique doubles drill-crew output

**Controlled feed · guided collaring · mechanical retraction—  
so one man can operate two rigs**

**N**ORTHERN SWEDEN has been the proving ground of a revolutionary rock drilling method which has opened the way to a completely new conception of drill-crew output. Known as the Swedish Ladder Drilling Method, this new technique has been employed on hydro-electric projects at Korselbränna and Stalon where drilling platforms with 16 rock drills operated by 8-man drill crews have been used.

Atlas Copco drills mounted on retractable pusher legs\* are rested in cradles running horizontally in "ladders". Contractors and drill crews have found that these rigs, cheaply and simply constructed, offer the following advantages:

**INCREASED PENETRATION**—full feed power is ensured by the

ideal horizontal feeding position of the pusher leg.

**HIGHER OUTPUT PER MAN/HOUR**—due to greater penetration and the fact that *one man handles two drills*.

**REDUCED CREW FATIGUE**—collaring is made simple as operators need not hold the drills. Drill steels are mechanically withdrawn from holes using the retractable pusher leg.

**FEWER DRILL STEEL CHANGES**—long steels can be used from the start. For greater durability 1" Sandvik Coromant integral steels are used.

**GREATER DRILLING ACCURACY**—thanks to the fixed ladder base and pre-positioning of drills for pattern drilling.



# DRILLING METHOD



## DRAMATIC RESULTS OF LADDER DRILL TESTS

The figures show the dramatic increase in drilling achieved by ladder rigs in a 60 sq.m. tunnel at Stalon driven in hard-drilled quartzite. Gross effect refers to the mean value for the whole drilling period, including collaring, changing steels and the usual routine delays. *Note that the gross effect is exactly doubled.*

### GROSS EFFECTS

19.5 metres/man-hour Conventional drilling with one rock drill

39.0 metres/man-hour Ladder drilling with two drills

### AVAILABLE FROM ATLAS COPCO

The Swedish Ladder Drilling Method was originally introduced by Widmark and Platzer, one of Sweden's leading contracting companies, and has been further developed by them and by the Swedish State Power Board. Specially evolved with Atlas Copco trigger-operated retractable pusher legs\*, this method and equipment has been exhaustively tested and proved under tough Swedish drilling conditions. There are Atlas Copco companies or agents in ninety countries and details of the new equipment are readily available from them or

from the address below. Wherever you are, the international Atlas Copco group offers expert advice on the selection of equipment and a complete after-sales service.

**WRITE FOR THE BOOKLET!** The Swedish Ladder Drilling Method is described in greater detail in a new Atlas Copco booklet. Write for a copy to your local Atlas Copco company or agent or from the address below.

\* Patents pending

# Atlas Copco

**PUTS COMPRESSED AIR TO WORK FOR THE WORLD**  
ATLAS COPCO AB, STOCKHOLM 1, SWEDEN

# Twenty-First Geological Congress

**T**HE twenty-first International Geological Congress was held in Copenhagen from August 16 to August 25, the host countries being Denmark, Finland, Iceland, Norway and Sweden. Attendance exceeded all previous meetings amounting to 2,600 geologists, and about 1,300 accompanying members, mainly families but also some friends and interested non-geologists. The high attendance was in part due, no doubt, to the venue being so convenient for many Europeans, nevertheless, the U.S.A. again headed the list with close on 500 attending geologists. France, United Kingdom and Germany followed with roughly similar representation. The U.S.S.R. had more than ever before, listing 75 attending; and it seemed that more of them spoke English on this occasion. Altogether 85 countries were listed.

## Organization and Setting

The buildings used were the Technical University and the Chemical Institute, the registering and gathering ground being in the four-storied rotunda of the former. Here there was seething activity around the information centres.

The keynote of the Congress was efficiency and our hosts cannot be sufficiently congratulated on the organization. We arrived to find not only the abstracts but all the papers submitted had already been printed. In contrast with the last congress, there was definitely a more serious tone which can best be described as a quieter and more orderly approach natural to the setting, as against the exotic, highly colourful and more hectic life in Mexico City. Not that hospitality was by any means lacking, the civic reception in the dignified and beautiful Rathaus was lavish. There was much private entertaining, and the Embassies too did their share, that of Canada being one of the outstanding parties. The excursions arranged for accompanying members were also much appreciated. Copenhagen impressed us as an extremely friendly, tidy, and well conducted city.

## Well Attended Meetings

It would not be possible for any one man to evaluate the meetings. Two and a half thousand geologists attended varying proportions of the three hundred or so papers submitted. The comments that follow are therefore those of the writer. Doubtless there is room for many views. Meetings were for the most part well attended and upon occasion there was standing room only.

There were 21 sections. Of these, Nos. 2 Geological Results of Applied Geochemistry and Geophysics; 15. Genetic Problems of Uranium and Thorium Deposits; 16. Genetic Problems of Ores; and in part 20. Applied Geology, were in varying degree relevant to the geology of mineral deposits. There was also no symposium devoted to an economic mineral as in former congresses, for example, lead in 1948, iron in 1952, and manganese in 1956. There were those who thought this was not enough for the student and practitioner of the geology of ore deposits, and the matter was placed before Council who recommended the next Congress to give full consideration to the matter.

**By R. A. MACKAY**

*D.Sc (Lond.), A.R.S.M., M.I.M.M.*

There were, of course, outstanding papers that contributed importantly to the advance of science. Among those whose papers were presented at meetings which the writer attended, or which he happened to hear much discussed were Howell Williams, who gave a splendidly delivered lecture on his subject of fire and fury; Wyllie and Tuttle who gave evidence that granitic textures can be produced in the laboratory at high pressure in the presence of mineralizers; Berry who gave definite evidence from laboratory and field that dense rocks will exert a differential effect to the absolute passage of different ions; J. Gill who showed that sulphides at 400 deg. C. in a dry atmosphere migrated for several centimetres by solid diffusion with no pressure exerted and in so doing produce textures with which we are all familiar in nature; Earl Ingerson who summarized with complete objectivity what we know of sedimentary carbonate formation and what we do not know, and what is being or ought to be done about it; and F. A. Williams who pleaded for greater use of "fragmental petrology". And there were many other papers of a factual type.

## Opposing Theories

In contrast were a greater number of papers pleading for opposing theories we had heard before and using facts or opinions we had heard before. Upon occasion the opposing forces made little attempt to listen to one another or even answer the righteous questions of their adversaries. The present writer thinks that ore genesis theory at present runs too far ahead of the available facts and observations, and that therefore the factual class of paper is of much greater value than the last mentioned group.

An interesting undertone was the mention of diagenesis (or a synonym for it) in several discussions. The writer has long thought that this period of geology during which sediments turn to rocks has been sadly neglected; indeed, the whole of the writings on it would barely fill a single volume. Yet during this period there may be clues to some of the problems which face us in ore geology.

## Venue for 1964

The Congress, after discussion of offers from India and New Zealand, accepted the invitation of India to meet there in 1964.

The Congress broke up on August 25 and many members then departed to excursions that had been organized in Scandinavia. There had also been numerous excursions before the Congress and the accounts one heard of these were enthusiastic. Judging from the one attended by the writer, the organization, interest, and hospitality were of a high level.

# MINING MISCELLANY

American Metal Climax is to spend nearly \$3,000,000 to expand the potash producing facilities owned by Southwest Potash Corp., at Carlsbad, New Mexico, to keep pace with expanding sales. This will be the second expansion programme undertaken by Southwest since production began in 1952.

★

Mr. Frederick Hackett, New Zealand Minister of Mines states that, after a year's investigation of his country's uranium resources, the British Atomic Energy Authority is not to proceed further in New Zealand, as no deposits of uranium economic at current prices have been disclosed there.

★

The Brazilian Government has set up a special study group of the country's National Economic Development Council to study problems connected with the Brazilian ore industry, including the difficulties caused by insufficient transport facilities, and Hanna Corporation's plans for building their own railway port for Minas Gerais ores. No reports may be expected from this committee before the national elections on October 3.

★

Fuel shale deposits with reserves amounting to between 200,000,000 and 250,000,000 tons have been discovered in South Kirghizia, Russia. Thick seams lie close to the surface, making open-cast working possible.

★

Professor Rolf F. Rutsch, chief geologist of the Swiss Government, has arrived in Israel under U.N. auspices, to advise the Geological Survey of the Ministry of Development on prospecting for natural resources. Mr. Ismail Kefescioglu of Turkey is also in Israel for six months' advanced study in micropaleontology at the Geological Survey, and it is expected that on his return to Turkey he will head the Micro-Paleontological Laboratory of the Turkish National Oil Co., which is sponsoring his stay in Israel.

★

Lithium Corporation of Canada plans to resume shortly exploration of its property in the Bernic Lake area of Manitoba, in the hope that caesium-bearing pollucite found on the adjoining property of Chemalloy Minerals extends to its own holdings. Former drilling and underground exploration on the company's Cat Lake property indicated 1,203,500 tons averaging 1.5 per cent lithia.

★

Further maps in the series of 160 aeromagnetic maps covering 60,000 sq. miles of north-western Ontario, will be released by the Ontario Dept. of Mines on September 19. The most recent area covered is to the east of the Red Lake gold belt in the District of Kenora, and the individual sheets are for: Aerofoil Lake, Bluffy Lake, Confederation Lake, Shabumeni Lake, Mamakwash Lake, Conover Lake, McDowell Lake, Hewitt Lake, North Spirit Lake, and Niska Lake.

The Camiguin Mining Co., announces that it has started production of refined sulphur in the Philippines using a kiln invented by two Filipino engineers. The Samar Mining Co. reported that following its first initial shipment of 10,000 tonnes of iron ore from its Sibuguey ore deposits recently made to Japan, further shipments totalling 150,000 tonnes were expected to be made during the remainder of 1960, and that it was shortly to establish a cold rolling mill.

★

The metal producing industries of France, particularly steel and aluminium producers, have estimated a rise of 12 per cent in their industry during the autumn of 1960.

★

Noranda Mines, of Canada, reports the finding of a new copper-silver deposit, containing 500,000 tons of material grading 2 or 3 per cent copper with silver content sufficient to pay costs, on the Vancouver Island property of Mount Washington Copper Co. Nordanda Exploration, who had been carrying out the investigation, have exercised their option to form a new company to take over the property from Mount Washington.

★

It is reported from Budapest that a new deposit of brown coal, estimated at about 700,000 tons, has been discovered at Matraszele, in northern Hungary. The quality is better than that of the brown coal mined in the Nograd coalfields, and as the deposit lies only 90 ft. below the surface, it may be mined by open-cast methods. Hard coal in Hungary is only found in the southern coalfields around Pecs.

★

Several foreign companies are acquiring rights for prospecting for oil in South-West Africa, including the Texas Eastern Transmission Corporation, and a Canadian company. A detailed survey by air was carried out in 1959 by Trans-America Mining Corp., to determine whether more intensive search of their ground would be justified. The Diamond Mining and Utility Co. (S.W.A.) ceded rights to this corporation to prospect for oil and gas in two concession areas in South-West Africa, and altogether ten concessions, covering nearly half the total area of the territory, have been granted in recent years.

★

Bulgaria has recently assembled an excavator weighing 1,252 tons supplied from East Germany. The excavator, which is at the Maritsa Istok brown coal basin, handles 2,000 cu.m. of overburden an hour, including the loading into waiting railway wagons. A second similar excavator is now being assembled.

★

It was recently discovered that the sand on the seashore near the Black Sea port of Bourgas, in Bulgaria contained 55 to 59 per cent of magnetite. Magnetic separators have now been installed and a daily output of 30 to 35 tons has been established.

The Bill laying down plans for reconstruction of Chilean zones ravaged by earthquakes last May, which was adopted by the Senate Finance, Economy and Public Works Committees in August, has been passed by the Chamber of Deputies with minor amendments. A change has been made in the clause providing that American copper companies subscribe to the government loans equal to 20 per cent of their annual profits taken out of the country during a certain period. This period has been altered to 30 months from five years.

★

Hungary is to aid Roumania in building up a lignite-mining industry, which has been stagnating for many years. Hungarian experts recently visited Wallachia, which is to be centre of the industry, and a number of Hungarian brown coal mining machines are to be supplied to Roumania through the Hungarian foreign trade organization Nikex.

★

Hudson Bay Mining and Smelting Co., is to bring its new wholly-owned mine, Chisel Lake in Manitoba, into production on September 1. Chisel Lake starts with a capacity of 1,000 tons per calendar day, equal to 1,400 tons per operating day; the ore mined is 11 per cent zinc, lead content being around 1 per cent. Lead concentrates will be recovered, along with less than 1 per cent copper and good gold and silver values. Flin Flon Mine's daily tonnage will be cut by the amount of Chisel Lake ore. Including the Coronation and Schist Lake mines, production from the newer mines will shortly be providing about 2,100 tons per calendar day of the company's treatment plant tonnage of roughly 4,600. These mining operations will lengthen the life of the Flin Flon mine, which according to the *Northern Miner*, is now placed at 11 or 12 years, or perhaps more.

★

The Atomic Weapons Research Establishment of the U.K. Atomic Energy Authority at their stand at the Corrosion and Metal Finishing Exhibition in London in late November, will illustrate various techniques in connection with specific corrosion problems in the atomic energy industry. These will include the protection of uranium by coating with other more resistant metals; and by application of certain paints; various paints developed for the protection of magnesium alloys and the protection of surfaces from radioactive contamination.

★

The member countries of the Eastern European economic co-operation body, Comecon, are to supply quotas for supplying the Comecon bloc as a whole. Within the mineral fields the closer co-ordination of Comecon industry is reflected by plans for the annual supply to Hungary, Poland, Czechoslovakia and East Germany of 25,000,000 tonnes of Russian iron ore and 15,000,000 tonnes of Russian mineral oil, while Hungary is to undertake the supplying of Comecon with bauxite and Poland with coal and coke.



## Machinery and Equipment

# Russians See New Mining Machine

A party of Russian engineers from the U.S.S.R. Trade Delegation to Great Britain recently attended the specification tests of a completely new type of mobile roof scaling tower. The tests were held at the Glazebury plant of the manufacturers, F. Taylor and Sons (Manchester) Ltd.

The tower, one of four now in production (see *M.J.*, May 13, 1960, page 554), forms part of the £250,000 contract for mobile mining equipment secured last autumn and is destined for use in Soviet mines in conjunction with Taylor mobile drilling equipped with Holman drifters. There it will be employed for roof scaling, roof bolting, drilling and general inspection purposes for mine roofs of up to 90 ft. in height.

The machine consists basically of a hydraulically operated tower consisting of five telescopic sections mounted on

an electrically powered crawler chassis. When fully extended the tower platform achieves a maximum height of 81 ft. and carries a safe working load of 660 lb. For travelling purposes the tower can be retracted and then pivoted through 90 deg. to rest on a sub frame attached to the chassis. This results in a minimum overall height of 11 ft. 3 in. enabling the machine to move freely under relatively low headroom conditions.

On reaching the desired working area the telescoped tower sections are raised to the vertical position to rest on a pivoted sub frame by twin double acting rams. The outer tower section is then locked into position by tapered locating pins.

At this stage it is necessary to ensure that the tower is vertical. Accordingly, the tower chassis is primarily levelled in the lateral plane by slewing on the crawler tracks until the level indicator situated in front of the driver moves to within prescribed limits. The tower is then adjusted longitudinally by means of twin tower levelling screwjacks attached to the chassis which raise or lower the sub frame until another level indicator reads correctly.

The four support, or stabilizing, legs are now brought into action. These are fixed to the four top corners of the outer tower section and are secured alongside the tower when not in use. They are initially extended by small hydraulic rams, adjusted manually and are then extended downwards by another double acting ram until each of the four spiked feet is firmly embedded in the ground.

The maximum hydraulic pressure admitted to these rams is kept very low by means of a separate pre-set overload valve. The oil circuit to the rams is protected and locked by pilot operated non-return valves so that once set they can

not be altered until the work has been completed.

The tower is now extended by operating a push button control on the platform which brings into action a double acting hydraulic ram with a 14 ft. stroke. This is only attached to the first two sections, but a connecting system of wire ropes and pulleys ensures that any ram movement is imparted simultaneously to all sections. The time taken for the tower to reach maximum height from this position is 2½ min.

An interesting feature of this ram hydraulic circuit is the inclusion of restrictor valves. These come into operation in the event of any pipe being damaged, ensuring that the tower descends at a relatively slow and safe rate.

Hydraulic power for all these operations is supplied by a hydraulic pump driven by a 7½ h.p. electric motor. This and the 40 h.p. motor for the chassis drive derive their power from a trailing cable connected to a 100 amp. plug and socket fitted to the chassis. This also provides power for two 300 watt lamps used to illuminate the mine roof and travelling and parking lights.

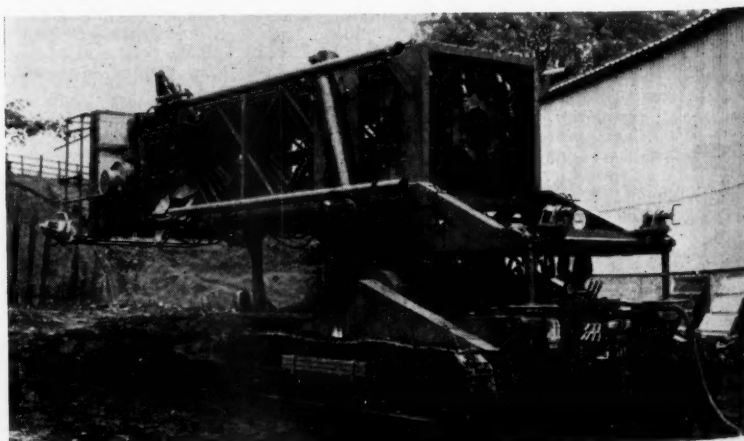
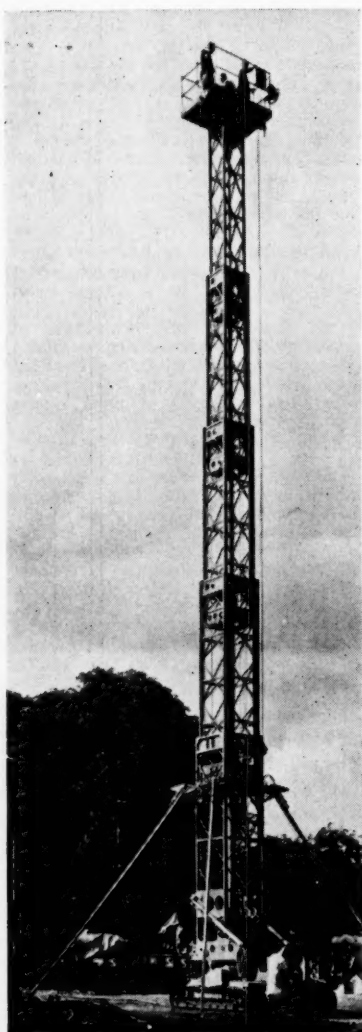
The chassis is constructed from steel channel members suitably cross braced and is mounted on crawler tracks interconnected through a single rocking beam centrally attached to the chassis. This method of suspension permits a limited articulation for travelling over rough ground. The tower can negotiate a maximum gradient of 1 in 10 and top travelling speed is approximately 1.05 m.p.h.

Despite the machine's apparent bulk (26 ft. length and 10 ft. 10 in. width) weight does not exceed 12 tons and track pressure is restricted to 1.4 lb. p.s.i.

## RAPID FLOTATION CONTROL

The Quantrol X-ray device of Anaconda Co.'s Anaconda smelter gives an almost instantaneous copper assay of mill products, which allows mill operators to make quick adjustments and corrections when necessary. The device has been observed in *Engineering and Mining Journal*.

At left, the front view of the Taylor mobile Roof Scaling Tower extended to its maximum height of 81 ft. Below, is the rear view of the tower in travelling order, illustrating the levelling jacks and the stabilizing leg and tower erection controls





Essentially, the device X-rays slurry samples received through pipelines from various parts of the mill, and gives a quick copper assay. It assays 13 different samples of five different family groups, reporting an assay on each sample every 15-30 min. A density gauge corrects for fluctuations in the solids content, and a computer instrument combines this information with the X-ray readout to deliver the correct assay.

Remote indicators inform operators of the flotation circuit in the mill of the assay of their feed, concentrate and tailings. Since they get these reports at least every 30 min., the operators can almost perfectly control the quality of the product, quickly taking any corrective action that the assay reports show necessary.

#### SOUTH AFRICAN WINDER WITH MERCURY-ARC CONVERSION

In the 2b Tertiary Shaft at Venterspost, at a depth of 6,000 ft. Gold Fields of South Africa Ltd., have commissioned the first d.c. mine winder in Africa supplied from a grid-controlled mercury-arc converter, the complete electrical equipment having been supplied by Associated Electrical Industries Ltd., Heavy Plant Division. The winder, which works in an ambient temperature of 85 deg. F. (wet bulb—90 deg. dry bulb), is driven by an AEI 1,200-h.p. 520 r.p.m. motor. Operating in a shaft 3,800 ft. long, inclined at an angle of 34 deg. to the horizontal, its hourly output of ore is 185 tons.

The first mine winder in Britain supplied by a mercury-arc converter was installed by Associated Electrical Industries Ltd. in 1954. Since then, seven similar AEI winders have been installed—three of them the multi-rope tower-mounted type.

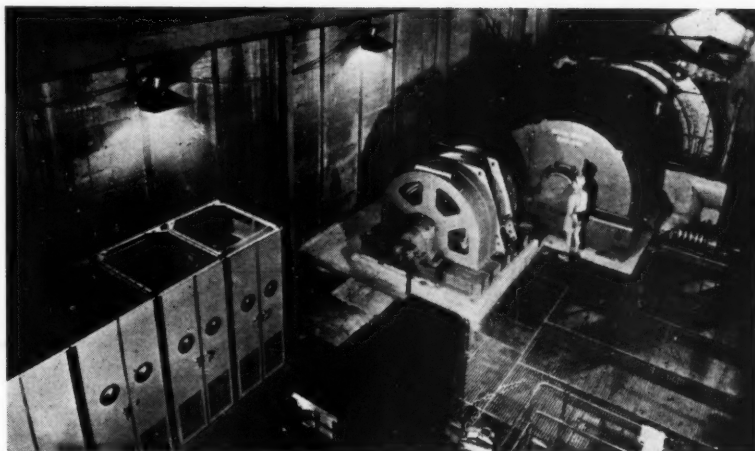
In an underground winding house, such as that at Venterspost, a mercury-arc converter has the advantages that power consumption is less than that with conventional equipment; standing losses are smaller; heat dissipation is less (with an a.c. winder, it would be almost twice as much); the winder and its associated equipment can be accommodated in a smaller space, and lighter foundations can be used; the installation is quieter than rotary equipment; since the conversion equipment is static, maintenance is reduced.

#### A MOBILE PLANT

A mobile elevating, screening and stocking plant was shown to senior N.C.B. engineers at Moorgreen Colliery, Eastwood, recently by Michael and Partners Ltd. The plant was developed at N.C.B. request.

The machine, known as a Loadascreen, was demonstrated in use as a stockpiler. Lorries discharged coal into the Loadascreen's apron hopper at ground level, and a 30 in. wide belt, running on 50 ft. centres, lifted the coal to a 48 in. by 96 in. double deck vibrating screen. In this case, however, the top screening cloth was replaced by a solid plate so that the screen acted as a vibratory conveyor. The coal then passed down a fish-tailed chute to the stockpile.

It was seen that the design of the Loadascreen enabled coal to be stock-



piled to a height of 18 ft. with negligible degradation. The apron hopper has rubber flaps at the back to seal against lorry sides and bottoms, and adjustable drop fingers at the front to control the flow of the coal up the conveyor. The coal falls less than 9 in. from the conveyor head to the vibrating screen and a strip of belting has been fitted to slow down the material as it passes over the screen.

radius of 64 ft., laying down a stock of coal 120 ft. wide.

The conveyor of the prototype Loadascreen demonstrated was powered by a 15 h.p. squirrel cage, totally enclosed and weatherproof electric motor and the hydraulics were operated by a 7½ h.p. electric motor. The Loadascreen can be powered alternatively by diesel engines.

Apart from stockpiling, the Loadascreen can be used for loading road or

Above is the 1,200-h.p. AEI winder in the Venterspost 2b Tertiary Shaft, South Africa. This winder, which operates at a depth of 6,000 ft., receives its d.c. supply from the mercury-arc converter cubicles (left). Below, N.C.B. officials are inspecting the prototype Loadascreen being used to stockpile coal delivered by lorries to the stockpiling area at Moorgreen Colliery, Eastwood. The pile in the foreground was blinded with slack before the demonstration. The pile on the left indicates minimum degradation

The boom elevation, the discharge chute angle, and the rear castor wheels are hydraulically controlled from a cab which, in the marketed model, will be totally enclosed by sheet metal walls with perspex opening windows fore and aft. The Loadascreen is mounted on a pair of swivelling road wheels so that from one position of the hopper the machine can stockpile in an arc with a

rail vehicles. In this case, a three-way discharge chute is fitted to the vibrating screen so that three grades of coal can be loaded into three vehicles at one time. Screen cloths will be supplied according to requirements.

The Loadascreen is manufactured by Frederick Parker and Co. Ltd., to the design of Michael and Partners Ltd., who are handling sales.



## Metals and Minerals

## U.K. Antimony Metal Prices Raised

Higher prices for antimony and antimony products have been announced by Associated Lead Manufacturers Ltd. The new prices (per 1 ton), which became effective on September 12, are as follows (the former prices being given in parenthesis):

Antimony metal (99 per cent), 10 cwt. and over, £200 (£190); antimony metal (99.6 per cent), 10 cwt. and over, £207 10s. (£197 10s.); white oxide, 5-ton lots, £188 (unchanged); "O" quality antimony oxide, 5-ton lots, £185 (£177). Crude and British pharmaceutical prices remain unchanged.

These changes represent the first upward revision in the U.K. domestic antimony metal prices for a very long time. Prices have, in fact, remained unaltered since November 1, 1957, before which date they had been progressively reduced. During this period the market has been steadily undermined by lower-priced imports from China and Russia. However, as noted in our issue of August 12 (p. 185), the demand for antimony has risen considerably in recent months, due to an upward trend in consumption which appears to be world wide, and this situation has been reflected in the recent firmness of the ore market. In view of the continuing rise in raw material costs,

the higher metal prices announced by Associated Lead Manufacturers can have occasioned little surprise.

It remains to be seen whether the higher U.K. prices will stimulate greater interest in the cheaper Russian and Chinese brands. Before this week's rise, the margin between U.K. and foreign metal, including the £40 per ton import duty the latter carries, appeared insufficient to arouse much interest in buyers.

Chinese 99.6 per cent grade was recently quoted at up to £144 per tonne c. and f. excluding the duty and delivery charges, compared with the then comparable U.K. grade of £197 10s. per 1 ton delivered. China, however, has already followed the U.K.'s example in raising her price by the equivalent of £10 a ton, and it seems highly probable that Russia will also follow suit, although she has actually increased her price by £2 in the last six weeks. China, in fact, is believed by some dealers to have sold almost all the metal she has available this year, due to the heavy demand from various quarters aggravated by the prolonged strike at the major Belgian refineries during the early summer. Despite the tighter supply position, however, the Communist countries are expected to

continue underselling U.K. producers, by approximately the same margin as before.

## NO THREAT TO BOART

Among the victims of the Congo chaos are the diamond mines of the Kasai, which produce 60 per cent of the world's industrial diamonds—mostly in the form of crushing board. Last year the Kasai produced 658,000 ct. of diamonds, of which about 30 per cent were gemstones. At the beginning of August the Kasai was working normally, but operations were suspended a few days ago as a result of the civil war. A spokesman of the Diamond Corporation has stated, however, that sufficient stocks of crushing board are available to meet the current rate of demand for a full year. It is anticipated that the Kasai mines will be able to resume production as soon as the situation becomes more settled. Meanwhile, there appears to be no indications of any abnormal stockpiling. There is still some American stockpiling, but for which there would have been a surplus of industrial diamonds this year.

## AUSTRALIA TO BUILD BAUXITE PORT

The construction of a new Australian bauxite port at Weipa, Northern Queensland, will begin next year, it has been announced by Senator Malcolm Scott, chairman of the Government's Mining Committee, and regular shipments of bauxite from there to Tasmania will be effected within four years.

Senator Scott said that Consolidated Zinc's purchase of a controlling interest in the Bell Bay (Tasmania) aluminium undertaking (see *The Mining Journal*, September 2, 1960, pp. 264 and 266) was the "green light" for Weipa. Comalco, which is developing the Weipa bauxite deposits, would now go ahead to establish at Weipa a port, a township for 5,000 people, and a plant to convert bauxite to alumina for shipping to Bell Bay. It would take about four years to get Weipa into production of alumina. By that time, Bell Bay would have increased its output of aluminium from 12,500 to 28,000 tons. The higher production rate, coupled with Weipa's cheaper bauxite, would enable Bell Bay to sell aluminium at £37 10s. under today's price.

## CHEAPER BERYLLIUM

Some beryllium metal prices in the U.S. have recently been reduced and others realigned. On August 15 an additional 5 per cent discount was offered by Brush Beryllium to customers ordering hot press, machined rod in quantities over 6 in. long. A piece of 7 in. rod formerly costing \$70 would now sell for \$66.50. Beryllium Corporation announced its intention of following Brush's realignment of rod quantity discounts.

Brush has also established a new price for beryllium powder made from virgin

## LONDON METAL AND ORE PRICES, SEPT. 15, 1960

## METAL PRICES

Aluminium, 99.5%, £186 per ton  
Antimony—  
English (99%) delivered, 10 cwt. and over £190 per ton  
Arsenic, £400 per ton  
Bismuth (min. 1 ton lots) 16s. lb. nom.  
Cadmium 10s. 6d. lb.  
Cerium (99%) net, £15 0s. lb. delivered U.K.  
Cobalt, Cr. 99% 6s. 11d./7s. 4d. lb.  
Cobalt. 12s. lb.  
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram  
Gold, 250s. 2½d.  
Iridium, £20/£23 oz. nom.  
Lanthanum (98%/99%) 15s. per gram.

Magnesium, 2s. 2½d./2s. 3d. lb.  
Manganese Metal (96%/98%) £275/£285  
Nickel, 99.5% (home trade) £600 per ton  
Osmium, £18/£22 oz. nom.  
Osmiridium, nom.  
Palladium, imported, £8 12s. 6d.  
Platinum U.K. and Empire Refined £30 5s.  
Imported £284/284  
Quicksilver, £69 ex-warehouse  
Rhodium, £43/£45 oz.  
Ruthenium, £14/£16 oz. nom.  
Selenium, 30s. 0d. per lb.  
Silver, 79½d. f. oz. spot and 79½d. f'd  
Tellurium, 28s. 6d. lb.

## ORES AND OXIDES

Antimony Ore (60%) basis .. .. . 20s. 6d./21s. 6d. per unit, c.i.f.  
Beryl (min. 10 per cent BeO) .. .. . 240s./245s. per 1 ton unit BeO  
Bismuth .. .. . 30% 5s. 0d. lb. c.i.f.  
20% 3s. 3d. lb. c.i.f.  
Chrome Ore—  
Rhodesian Metallurgical (semifriable 48%) (Ratio 3:1) .. .. . £15 5s. 0d. per ton c.i.f.  
" Hard Lumpy 45% .. .. . (Ratio 3:1) .. .. . £15 10s. 0d. per ton c.i.f.  
" Refractory 40% .. .. . £11 0s. 0d. per ton c.i.f.  
" Smalls 44% .. .. . (Ratio 3:1) .. .. . £13 5s. 0d. per ton c.i.f.  
Baluchistan 48% .. .. . (Ratio 3:1) .. .. . £11 15s. 0d. per ton f.o.b.  
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10:1) .. .. . Nb<sub>2</sub>O<sub>5</sub> : Ta<sub>2</sub>O<sub>5</sub> 180s./185s. per 1 ton unit c.i.f.  
Fluorspar—  
Acid Grade, Flotated Material .. .. . £22 13s. 3d. per ton ex. works  
Metallurgical (75/80% CaF<sub>2</sub>) .. .. . 156s. 0d. ex. works  
Lithium Ore—  
Petalite min. 31% Li<sub>2</sub>O .. .. . 50s. 0d./55s. 0d. per unit f.o.b. Beira  
Lepidolite, min. 31% Li<sub>2</sub>O .. .. . 50s. 0d./55s. 0d. per unit f.o.b. Beira  
Amblygonite basis 7% Li<sub>2</sub>O .. .. . 75s./85s. per ton f.o.b. Beira  
Magnesite, ground calcined .. .. . £28 0s./£30 0s. d/d  
Magnesite Raw (ground) .. .. . £21 0s./£23 0s. d/d  
Manganese Ore Indian—  
Europe (46%-48%) basis 60s. 0d. freight .. .. . 73d./75d. c.i.f. nom.  
Manganese Ore (43%-45%) .. .. . 69d./71d. c.i.f. nom.  
Manganese Ore (38%-40%) .. .. . nom.  
Molybdenite (85%) basis .. .. . 8s. 11d. per lb. (f.o.b.)  
Titanium Ore—  
Rutile 95/97% TiO<sub>2</sub> (prompt delivery) .. .. . £29 0s. 0d. per ton c.i.f. Aust'n  
Ilmenite 50/52% TiO<sub>2</sub> .. .. . £11 10s. per ton c.i.f. Malayan  
Wolfram and Scheelite (65%) .. .. . 155s./161s. per unit c.i.f.  
Vanadium—  
Fused oxide 95% V<sub>2</sub>O<sub>5</sub> .. .. . 8s./8s. 11d. per lb. V<sub>2</sub>O<sub>5</sub> c.i.f.  
Zircon Sand (Australian) 65-66% ZrO<sub>2</sub> .. .. . £16/£16 10s. ton c.i.f.

metal and scrap, which now sells at \$64-68 lb. depending on quantity. Higher grade material is still priced at up to \$76 per lb., while lumps, beads and pebbles remain at the \$70 per lb. level established last year.

Further gradual reductions are expected as consumption increases in the aerospace, nuclear and civilian fields. The anticipated floor price for raw beryllium ingot material, if large-scale purchasing develops, is expected to be about \$60 per lb.

## U.S. QUARTERLY RETURNS

Production of primary antimony by domestic smelters in the second quarter of 1960 increased by 11 per cent, according to the Bureau of Mines, U.S. Department of the Interior, amounting to 2,558 s.tons compared with 2,307 s.tons in January-March, 1960. Most of the increased production was antimony metal and by-product antimonial lead. Total output for the quarter was 17 per cent above the average quarterly production in 1959.

Consumers used 3,300 tons of primary antimony in the second quarter compared with 3,400 tons in the previous quarter. General imports were virtually the same in both quarters, but were more than 13

per cent higher than the average quarterly imports in 1959.

Greater domestic production and decreased consumption raised industry stocks of antimony by 7 per cent during the quarter. At the end of June they stood at 7,180 s.tons. Most of the increase was in ore and concentrates and oxide.

Consumption of bismuth in the U.S. in the second quarter totalled 351,000 lb.

Although this was 7 per cent lower than in the figure for the first quarter, the January-June total of 727,600 lb. was 10 per cent above that consumed in the comparable period of 1959. Of all bismuth-consuming products, only that used in pharmaceuticals increased over the first quarter; consumption in the manufacture of all other products declined.

Consumers' and dealers' stocks of bismuth metal, which had declined in each of the three preceding quarters, increased 16 per cent in the April-June period. However, the 398,500 lb. of bismuth in stock on June 30, 1960, was almost a third less than was held in inventory a year earlier.

General imports of bismuth were larger in the second quarter of 1960 than in all of 1959. Peru supplied 80 per cent of the 504,500 lb. imported, Mexico 9 per cent, Canada 7 per cent and Yugoslavia 4 per cent.

On Wednesday Geomines announced that, owing to the outbreak of fighting in Manono, the tin mining centre in the north-west of the Katanga province, its mines were being temporarily closed. A Swedish unit of U.N. had been sent by air from Elisabethville to help restore order, and all Europeans were being evacuated from the town. Geomines' annual output of tin concentrates prior to restrictions averaged around 2,500 t.tons.

## LEAD AND ZINC WAIT ON GENEVA

The main interest as far as lead and zinc are concerned has been centred on this week's meeting in Geneva of the International Study Group. After having been content to await developments, buying interest has developed in the belief, as far as lead is concerned, that some action will be agreed upon to improve the current poor statistical position of the metal. Whilst a reduced contango has been maintained in the lead market, a backwardation has developed in zinc which, in both cases, indicates that, with foreign arrivals on a smaller scale, nearby supplies are not too readily available.

In New York both the lead and zinc quotations have been maintained at 12 c. and 13 c. respectively although business is slow. Zinc production declined in August in the U.S. due to the month-old strike at the two zinc smelters of the New Jersey Zinc Co. and the prolonged strike at the Bunker Hill Co. and American Smelting and Refining Co. as the following figures show:—

	August 1960	July 1960
Production ...	63,636	73,754
Total shipments ...	67,988	54,381
Stocks at month end ...	202,707	207,059

In O.E.E.C. countries lead production in July totalled 51,343 tonnes compared with 53,937 tonnes in June. This figure was 2 per cent lower than a year previous. Stocks at the end of the month increased to 65,154 tonnes, compared to 62,621 tonnes at the end of June.

In the case of zinc, July production was 72,786 tonnes excluding the Belgian Congo figures which were not available, whereas in June, when these figures were included, production came to 78,890 tonnes. Again excluding the Congo, stocks of zinc at the end of July totalled 51,980 tonnes compared with 57,601 tonnes.

Closing prices are as follows:

	September 8		September 15	
	Buyers	Sellers	Buyers	Sellers
<b>COPPER</b>				
Cash ...	£236	£236½	£236½	£236½
Three months ...	£236	£236½	£237	£237½
Settlement ...		£236½		£236½
Week's turnover	11,325 tons		11,525 tons	
<b>LEAD</b>				
Current ½ month	£70½	£70½	£70½	£70½
Three months ...	£70½	£70½	£70½	£70½
Week's turnover	4,350 tons		6,800 tons	
<b>TIN</b>				
Cash ...	£799½	£800½	£804	£805
Three months ...	£799	£799½	£801½	£802
Settlement ...		£800½		£805
Week's turnover	515 tons		640 tons	
<b>ZINC</b>				
Current ½ month	£86½	£86½	£89	£89½
Three months ...	£86½	£86½	£88½	£88½
Week's turnover	1,925 tons		6,925 tons	

## COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

There has been little alteration in the general pattern of the market during the week as the main considerations which, for the past several weeks have formed the background, remain unchanged. Whilst copper prices drifted lower earlier in the week, a sharp upturn has taken place in tin and some improvement is noted in zinc values.

### COPPER CUTBACK IN THE OFFING

Limited selling of forward copper in London has found the market less receptive than recently as the influential support, which has been in evidence for the past two weeks, was on a reduced scale. During the week, some buying developed from this quarter and values improved. It is generally believed that these purchases originate from one of the Rhodesian producing groups which lends support to the theory that these operations are of a stock-gap nature pending cutback measures foreshadowed in this week's announcement that both Anglo American Corporation and Rhodesian Selection Trust are considering the current world over-supply problem and the question of reducing supplies to the market.

European consumer demand remains quiet and although stocks in U.K. official warehouses showed a small decline of 375 tons to 8,024 tons, a small contango has remained.

In the U.S., customs smelters report quiet conditions and there is little doubt that a lower quotation would have been established but for the near certainty of

a strike in Chile after the end of the month and the confused situation in the Congo. Actually, under present conditions it is doubtful if a reduction would stimulate consumer interest to any great extent. The U.S. scrap price basis No. 2 wire has been lowered in two successive stages, ½ c. to 25 c. U.S. producers also report quiet conditions although some improvement in volume has been noted so far this month compared to August.

### SHARP RISE IN SPOT TIN

Local technical considerations, accompanied by a shortage of nearby supplies as a result of recent shipments abroad, brought about a sharp upturn in the tin quotations early in the week and a corresponding widening in the backwardation. This position would appear to be of a temporary nature although with the world supply — consumption figures delicately balanced, any improvement in consumer demand from any source could have an immediate impact on the market.

Stocks in L.M.E. warehouses declined 43 tons last week to 9,161 tons and on Thursday the Eastern price was equivalent to £808 per ton c.i.f. Europe.

It was announced during the week that Consolidated Tin Smelters had decided to build a smelter in Nigeria for the treatment of Nigerian ores in order to conform with the wishes of the Nigerian Government that these should be processed locally. Hitherto this material has been routed to the group's U.K. smelter.



## Mining Finance

# U.S. Gold Stocks Fall Fast Again

For six months or more, Kaffir investors have, not unnaturally, spent much of their time watching the confused course of events in Africa. But during the last nine weeks, a new factor has been added to the Kaffir situation — or, rather, an old one has regained its importance.

This is the question of the gold outflow from the U.S. In the first half of this year, it appeared that the outflow, which had reached alarming proportions at times in preceding years, was being contained. The fall in U.S. reserves continued, but at a much reduced rate.

It has now become clear, however, that this was not the case. Total gold losses from the U.S. this year amount to some \$466,000,000, of which more than three-quarters has been lost over the last nine weeks. Moreover, non-official opinion in the U.S. is tending more and more to the view that the improvement in America's overall balance of payments position in the first six months of the year was something of a fluke. According to one well-informed source, exports in the first half of 1960 were inflated by two factors: substantially higher shipments of cotton under government subsidy; and a high rate of completion of contracts for commercial jet aircraft. Both these factors were essentially short-term distortions of a basically adverse pattern.

Official spokesmen, on the other hand, see the current acceleration in the gold outflow as an essentially temporary phase induced by the high level of interest rates in Europe and elsewhere. This view may well prove to be too optimistic. It is certainly true that the disparity between short-term interest rates in Europe and the U.S. is a prime cause of the dollar's weakness in world markets, but whether this is temporary or not is quite a different matter.

If, indeed, the present situation were temporary, it would imply that the present trend of interest rates in Europe was downwards, or, alternatively, that U.S. rates were rising to meet those general in Europe. In fact, neither of these is happening, or, indeed, seems likely to happen. Though the West German Government has taken defensive measures against the inflow of hot money — as have the Swiss — it is most unlikely that they would be prepared to take the risk of over-stimulating industry which would be implicit in a significant reduction in short-term money rates. In the U.K., the trend of money policy in the near future was clearly indicated by the Bank of England when it forced the discount market "into the bank" last weekend. This was undoubtedly meant as a stern warning to the market that there was to be no early action to reduce bank rate.

On the other side of the coin is the fact that internal business conditions in the U.S. are still difficult. The steel industry is operating at 50 per cent of capacity, and few observers — except, of course, the official economists — expect an improvement to more than 70 per cent before the end of the year.

Other U.S. economic indicators show a similar depressing picture, particularly the inventory/sales ratio which has all the appearance of a minor recession in the making.

Clearly, therefore, there is no immediate indication that the recent acceleration in the gold outflow is about to be arrested, and

while it is true that any important change in American monetary policy is unlikely until after the presidential election, the pressure on the dollar is again severe. If it continues, the chances are that the inevitable increase in the gold price will come sooner rather than later.

## GOOD AUTUMN KAFFIR DIVIDENDS

With only the Harmony declaration to come, the autumn Kaffir dividend season has included some first-class declarations. Pride of place must be given to St. Helena, whose 2s. 9d. — to make 5s. for the year — was comfortably higher than had been generally expected. This was the fourth time in succession that Saints have added sixpence to their previous distribution, a record of consistent improvement virtually unequalled in the Kaffir market.

The sharp increase in Saints' payment was made all the more surprising by the imminence of tax liability — the first payment may fall due in the last quarter of this year or at latest in the first quarter of 1961. It was felt, therefore, that the board would probably pursue a cautious policy this quarter.

Ultimately, of course, Saints should be able to improve substantially even on the present 5s. rate. Tonnage throughput at the moment is about 170,000 per month, but there seems no reason why it should not reach 175,000 tons or even more in due course. Similarly, the present grade of a little below 7 dwt. is probably two or even three dwt. below the mine's ultimate potential. On the basis of 175,000 tons per month of 9 dwt. ore, Saints should be able to distribute 6s. per annum after full tax and lease — and this may prove to be conservative. On the same tonnage, a grade of 10 dwt. would indicate the payment of 7s. 6d. per share.

## WINKELS' MAIDEN SURPRISE

Another mine in the Union Corporation group to spring a surprise was Winkelhaak. Not so much that its maiden dividend was unexpected — most observers had forecast a token distribution late in 1960 — but because of its timing. Until now, the March and September dividend seasons had been limited to the O.F.S. mines. The Kinross field, it had, however, been supposed, would fall more naturally into the June-December pattern of the Rand, West Wits and Klerksdorp companies.

The most notable thing about Winkels' 4d. per share is that it has been paid only four years, eight months after the sinking teams began work on the first shaft, and barely 1½ years after the beginning of full-

(Continued on page 320)

## LONDON MARKET HIGHLIGHTS

Most mining markets became subdued this week. Kaffirs suffered from a contraction in the already small Johannesburg demand and although there was also very little selling share prices tended to ease. Matters were not helped by the chaotic conditions in the Congo nor by the deportation from South Africa of Bishop Reeves. The coming referendum in South Africa on October 5 also continues to be an unsettling factor.

But the undertone of the market stayed steady enough and a distinctly better tendency was seen on Wednesday. Western Holdings recovered 1s. 10½d. to 133s. 9d. and improvements of 7½d. took place in Free State Geduld (127s. 6d.) and St. Helena (73s. 9d.). The higher dividend caused Lydenburg Estates to harden to 13s. 9d.

Shares in the Finance group tended to move narrowly. Union Corporation held remarkably steady at around 55s. 9d., sentiment being impressed with the good progress made by the group's Winkelhaak mine. Gold Fields hardened to 66s. 6d. in front of the news that their Gold Fields Mining and Industrial subsidiary was to be the subject of a £5,000,000 issue of 7 per cent debentures (1980 - 1985) at par for the purpose of developing further the Group's mining and industrial activities outside South Africa.

A firmer start to the week in Copper shares was later dampened by Congo influences. News that production cutbacks were being considered on the Copperbelt did not, however, disturb the share market.

Nchanga provided a weak spot, falling steadily from 55s. to 52s. 6d. Part of this

move reflected switching operations into Rhodesian Anglo American which rose from 61s. 10½d. to 63s. 9d. helped by continued hopes of a good dividend next month.

Tins remained steady enough, but this was a poor response to the sharp rise in the metal price even if the metal rise was partly a result of technical influences. Ayer Hitam, however, gained 1s. 3d. to 25s. 3d. and following news of the completed Kinta River deviation project Southern Malayan hardened to 22s. 9d. It is believed that much of the apparent reluctance of the Tin share market to respond to good company and commodity news at the moment stems from recent over-speculation in Singapore.

Ghana Golds had a poor week. News of the statutory wage increase was followed by some political uncertainties and in a drifting share market Ashanti lost 1s. 1½d. to a low for this year of 16s. 4½d.

Among Australians, persistently lower advices from that country obliged dealers here to mark the price of Mount Morgan down by 2s. 7½d. to 12s. 7½d. No explanation for the weakness was received but the shares later rallied to 13s. 4½d. Mount Isa, on the other hand, responded to a revived demand from Australia with an advance of 3s. 6d. to 58s. 6d.

Elsewhere, Phoenix Prince were marked up 4½d. to 1s. 6d. following the surprise 1s. per share capital return. Also firm were Consolidated Murchison (48s. 1½d.) in recognition of the increase in antimony prices. Rio Tinto (31s. 10½d.) gained no benefit from the news of the group's Canadian copper venture.

## GEEVOR TIN MINES

The Forty-seventh Annual General Meeting of Geevor Tin Mines, Ltd., was held on September 14 in London.

Mr. G. W. Simms, the chairman, presided, and the following is an extract from his statement for the year ended March 31, 1960:—

The profit (before taxation) amounted to £58,463. After providing £27,542 to meet taxation, your directors recommend the payment of a final dividend of 2s. per share, making, with the interim dividend of 6d., a total distribution for the year of 2s. 6d. per share, less tax, requiring £31,605.

Generally speaking, development results throughout the year have been disappointing.

As the years pass and nothing is done by Government to alleviate the incidence of mine taxation in this country, one cannot help but wonder if it has even considered the question of the development of the Cornish Tin Mining Industry from the standpoint of enlightened self interest. Having regard to the position in Bolivia, Indonesia, and now the Congo, three countries of great importance as regards tin production, it seems a reasonable expectation that world supplies of tin are likely to be adversely affected in the future. If that be so, surely the time has come to encourage the development of the tin mining industry in this country. Long-term measures are required, and the first of these is alleviation of taxation by way of adequate depletion allowances for a wasting asset and recognition of the high risk nature of mining enterprise by granting taxation relief in the early operating stages.

The report and accounts were adopted.

## OBITUARY

## Mr. F. G. Atherton

After a prolonged illness, Mr. F. G. Atherton, a mining engineer, and a former director of The Cementation Co., died at his home in Doncaster on September 11. He was a recognized authority on shaft sinking problems and ground engineering techniques.

In 1926 Mr. Atherton joined The Cementation Co., with whom he spent all of his professional life. He travelled widely on behalf of the company, and in the inter-war years he spent a considerable period in India and South Africa supervising major contracts. Following the formation of Cementation (Contracts) Ltd., he was appointed a director of that company in 1949, and in June, 1953, he became joint managing director. He was also a director of several other companies in the Cementation Group, including Geoprosco Ltd., John Thom Ltd., Lazalloys Ltd., and of the parent company.

In our leading Note and Comment of September 2, p. 252 entitled "The End of Tin Restrictions", the number of miners was given as 1,500, instead of 15,000. We understand that the labour force was actually cut as a consequence of the severity of restrictions by 15,831—the lowest figure recorded being 21,340 on April 30, 1959, as compared with total labour employed of 37,171 at the end of November, 1957, the last full month before restriction was introduced. At the end of June 1960, the labour force stood at 26,771.

## Rand and Orange Free State Returns for August

## GOLD OUTPUT AND PROFIT

Company	August 1960				Year ends	Current Financial Year Total to date				Year ends	Last Financial Year Total to date			
	Tons (000)	Yield (oz.)	Profit† (£000)			Tons (000)	Yield (oz.)	Profit† (£000)			Tons (000)	Yield (oz.)	Profit† (£000)	
<b>Gold Fields</b>														
Doornfontein	105	43,302	225.5	J		210	85,922	442.2			189	76,682	377.3	
Libanon	117	27,960	67.7	J		234	55,870	134.8			217	50,824	118.8	
Luipaards Vlei	68	11,999	3.6	J		136	23,988	7.3			146	25,543	11.5	
Rietfontein	15	3,585	5.0	D		126	33,083	48.5			128	33,764	59.2	
Robinson	43	9,978	3.4	D		356	78,845	10.6			470	99,573	167.3	
Simmer & Jack	75	13,310	1.4	D		608	107,913	145.2			693	130,790	148.3	
Sub Nigel	66	15,282	15.1	J		133	30,361	30.3			133	31,659	44.9	
Venterspost	125	34,981	77.8	J		248	69,114	152.8			259	64,491	123.1	
Vlakfontein	52	18,828	88.6	D		413	148,201	699.5			404	144,817	684.1	
Vogels	85	18,343	19.5	D		685	147,346	162.9			736	165,165	208.9	
West Drie	130	121,506	1079.3	J		260	242,342	2152.1			196	179,230	1484.9	
<b>Anglo American</b>														
Brakpan	146	17,558	13.6	D		1,144	138,361	99.8			1,109	133,945	89.5	
Daggas	230	46,575	225.6	D		1,855	374,796	1821.4			1,919	387,051	1899.5	
East Daggas	107	18,190	42.4	D		843	143,030	326.2			797	132,876	258.5	
F.S. Geduld	95	82,100	658.4	S		1,036	890,311	737.0			880	683,318	5070.4	
President Brand	118	95,643	834.2	S		1,279	1,041,920	9142.8			1,148	899,956	7706.5	
President Steyn	103	38,401	161.6	S		1,117	431,352	1930.9			1,086	421,923	2126.9	
S.A. Lands	101	20,957	50.4	D		776	161,239	357.2			772	161,438	456.5	
Springs	98	13,668	13.0	D		817	113,632	114.3			731	113,774	99.8	
Vaal Reefs	104	46,575	245.0	D		787	354,152	1845.0			698	315,437	1664.0	
Welkom	100	31,781	80.4	S		1,083	341,837	826.3			1,049	320,871	872.8	
Western Holdings	157	12,551	88.9	S		1,621	1,073,535	8857.6			1,250	752,792	5774.9	
West. Reefs. Ex.	144	40,683	134.8	D		1,123	316,937	1057.1			1,028	268,619	793.7	
<b>Central Mining</b>														
Blyvoor	138	89,706	679.6	J		271	176,225	1328.9			266	170,230	1274.6	
City Deep	119	23,723	5.1	D		910	186,712	43.4			925	192,630	79.7	
Cons. M.R.	59	11,635	3.8	J		121	23,663	9.3			214	38,627	17.4	
Crown	206	35,129	9.2	D		1,605	271,588	50.2			1,771	280,573	98.5	
D. Roodepoort	198	36,186	49.8	D		1,544	282,539	395.3			1,522	281,569	428.9	
East Rand Prop.	235	54,457	74.1	D		1,780	436,966	669.9			1,781	460,966	970.8	
Harmony	173	69,263	321.6	J		340	136,093	626.8			287	113,040	521.6	
Modder East	138	12,972	0.6	J		263	25,806	1.7			289	27,528	6.2	
Rose Deep	23	4,496	1.4	D		194	34,445	10.2			319	42,174	0.5	
<b>J.C.I.*</b>														
Freddies Cons.	64	13,711	133.2	D		481	106,881	1,319.3			469	113,224	1,296.9	
Govt. G.M.A.	54	11,008	0.5	D		423	86,596	4.1			428	85,458	1.3	
Randfontein	28	5,743	2.1	D		196	38,709	23.8			285	49,403	73.7	
<b>Union Corporation</b>														
East Geduld	134	38,525	240.9	D		1,061	310,839	1993.2			1,102	331,077	2227.0	
Geduld Prop.	118	12,675	23.0	D		592	104,129	189.3			582	109,517	209.1	
Grootvlei	227	46,992	243.2	D		1,732	360,372	1837.8			1,680	355,429	1819.6	
Marievale	101	24,594	129.6	D		791	193,435	1008.2			750	184,965	902.3	
St. Helena	179	62,207	397.9	D		1,298	439,619	2722.8			1,190	359,726	1950.5	
Van Dyk	78	12,479	9.6	D		588	97,282	72.9			605	113,948	214.9	
<b>General Mining</b>														
Buffelsfontein	145	59,979	322.0	J		293	120,252	648.0			288	109,276	568.6	
Ellatton	28	6,615	23.5	D		228	53,975	199.8			250	58,254	234.8	
S. Roodepoort	31	7,391	23.8	J		61	14,604	46.6			60	14,367	45.7	
Stillfontein	168	76,300	417.6	D		1,286	580,166	3056.5			1,115	543,174	3298.8	
W. Rand Cons.	137	19,944	15.1	D		1,060	152,083	63.1			1,097	159,303	152.0	
<b>Anglo Transvaal</b>														
Hartebeestfontein	120	55,802	318.1	J		240	111,598	635.5			179	96,205	628.6	
Lorraine	82	17,429	115.3	S		865	181,153	1,210.3			845	165,097	1,209.0	
N. Klerksdorp	10	1,011	1.7	D		88	9,434	149.3			82	8,809	171.8	
Rand Leases	19	28,126	9.6	J		384	56,158	24.1			394	57,917	58.1	
Village M.R.	29	4,336	1.5	J		62	9,056	14.9			56	9,357	2.2	
Virginia O.F.S.	56	11,766	1154.7	J		192	40,345	1147.7			268	62,142	25.2	
<b>Others</b>														
Kleinfontein	77	10,467	0.5	D		623	81,209	3.9			662	85,873	24.8	
Wit Nigel	20	4,438	5.3	J		40	8,868	10.4			36	8,761	10.2	

Gold has been valued at 249s. 7d. per oz. fine (July 249s. 5d.). L indicates loss. † Working Profit. \* Working Profit includes sundry revenue. Tables excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipaards Vlei, Randfontein and W. Rand Consolidated.

## ESTIMATED URANIUM REVENUE

Company	Year Ends	Aug. Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)	Company	Year Ends	Aug. Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)
<b>Goldfields</b>					<b>J.C.I.</b>				
Doornfontein	J	15.0	30.0	28.0	E. Champ d'Or (b)	D	6.2*	54.8*	54.1*
Luipaards Vlei (a)	J	90.0	180.0	185.0	Freddies Cons.	D	34.0*	246.0*	278.0*
Vogels	D	53.0	434.0	417.0	Govt. G.M.A.	D	23.0*	184.4*	176.3*
West Drie	J	49.0	98.0	100.0	Randfontein (a)	D	98.0*	847.1*	847.9*
<b>Anglo American</b>					<b>General Mining</b>				
Daggafontein	D	136.2	1126.8	1101.4	Buffelsfontein	J	214.0	426.0	426.0
P. Brand	S	42.8	504.4	503.9	Ellatton	D	15.0	137.0	145.0
P. Steyn	S	60.8	675.9	657.8	Stillfontein	D	88.0	714.0	685.0
Vaal Reefs	D	143.3	1137.7	1132.6	W. Rand Cons (a)	D	200.7	1666.5	1601.8
Welkom	S	57.1	643.4	625.3	<b>Anglo Transvaal</b>				
West Reefs Ex.	D	156.6	1296.2	1269.3	Hartebeestfontein	J	250.0	500.0	531.6
<b>Central Mining</b>					Lorraine	S	32.0	380.0	380.0
Blyvoor	J	163.0	326.0	303.4	N. Klerksdorp	D	11.0	85.5	87.5
Harmony	J	263.7	512.6	401.2	Virginia O.F.S.	J	155.8	332.0	352.7

Table includes profit from uranium acid and pyrite before loan redemption. (a) Total profit from uranium section. (b) Overall profit. \*Net revenue after provision for loan redemption.

**Mining Finance (cont. from page 318)**

scale milling. This is highly satisfactory for the first mine in a new field, and there can be no doubt but that Winkelhaak is turning out to be a much better mine than was thought in the early days. With plans now in hand for an extension to 150,000 tons per month, and the grade rising steadily, Winkelhaak's profit-earning capacity is expanding rapidly, and one recent estimate put Winkels' potential dividend as high as 3s. 3d. per share, possibly as early as 1963.

This may or may not prove to be so, but certainly Winkels' success augurs well for the prospects of its neighbours Bracken and Leslie, which are still in the shaft-sinking stage.

**ANGLO'S FIVE**

The five O.F.S. mines under Anglo American management also had their star of the season. This was Welkom, which, after six consecutive payments of 3d., sprung a surprise by raising its dividend to 4½d.

This increase has an important side-effect in that it increases the rate at which the company redeems its debentures, which are reduced each quarter by an amount equal to the sum declared in dividends. If the 4½d. rate is maintained for both dividends next year, the debentures will have been fully repaid — which in turn means that the dividend could be effectively doubled at once.

The remaining Anglo group dividends were much in line with expectations. Particularly satisfactory was the 5s. 6d. declared by Western Holdings, although it could hardly be termed a surprise. Below is a table summarising the latest declarations, together with the three preceding payments for comparison.

	Mar. 1959	Sept. 1959	Mar. 1960	Sept. 1960
	s. d.	s. d.	s. d.	s. d.
F.S. Geduld	3 6	4 6	3 6	5 0
P. Brand	2 6	3 0	2 6	3 0
P. Steyn	1 3	1 3	1 0	1 0
W. Holdings	3 6	5 0	4 0	5 6
Welkom	3	3	3	4½
St. Helena	1 3	1 9	2 3	2 9

**BAD NEWS FOR GHANA MARGINALS**

The August returns of the West African gold producers carried a footnote to the effect that working cost figures — and therefore profits — were provisional. This unusual state of affairs results from the recent statutory increase in the minimum wage in Ghana to 6s. 6d. per day. On the mines this represents an increase of 1s. 6d. per day for each African employed, if, as must be assumed, the present 6d. differential between surface and underground workers is maintained.

Clearly, such an increase would present extreme difficulty to mines like Amalgamated Banket Areas and Bibiani, where the profit per ton is small. Nevertheless, it would be surprising if such mines were to be allowed to bear the full effects of such a blow after the Ghanaian Government's earlier concern for the future of these and other mines, expressed in the tangible form of financial assistance. It may be that the commission soon to sit to discuss the application of the new statute to the mining industry will consider some means of alleviating the burden on the marginal producers. It is also possible that the Monture report, commissioned by the government, may have contained some recommendation

relevant to the present situation. This, however, must remain conjectural since the Monture findings have never been made public.

In any event the quite sharp fall in the price of Ashanti shares appears to be unjustified. With its remarkably rich ore and comparatively small tonnage, Ashanti would suffer very little even if the whole weight of the new statute were applied to it. At their present price of about 16s. 6d. to yield around 12 per cent, Ashanti must rank among the best buys for income in the mining market.

**LYDENBURG ESTATES PAYS MORE**

Lydenburg Estates, one of the Anglo American group holding companies, has declared a dividend of 1s. 3d. per share for the year to June 30 last. This compares with a payment of 1s. for 1958-9.

Lydenburg's profit for the year, before tax and write-offs, was £44,961, an improvement of almost £3,000 over the preceding year. Tax showed a sharp reduction from £14,533 to £6,685, but the benefit of this was largely absorbed by a write-off of £7,395 from an investment.

Lydenburg's principal investments are 115,000 President Brand, 100,000 President Steyn, and 133,000 Welkom. It is the Brand shareholding that accounts for the large reduction in tax. Before this property became the first O.F.S. producer to incur a tax liability, its dividends were liable to the full rate of taxation in Lydenburg's hands. Now, however, Brand is a fully fledged taxpayer, paying a rate sufficient to make its dividends free of tax as far as Lydenburg is concerned. This is a point often overlooked by high-tax-paying private investors in the U.K. When, for example, Free State Geduld becomes a full taxpayer, those with a high enough effective rate will be able to reclaim enough to almost double the value of the dividend in their hands.

**Rights Issue by De Beers Industrial.**—De Beers Industrial Corporation is to make a rights offer of 2,500,000 new ordinary £1 shares at £2 per share. The shares will be offered to existing shareholders in the ratio of one new share for every four held. The purpose of the issue is to replace the loan of £5,250,000 made by De Beers Investment Trust to finance the expansion of African Chemicals and Explosives, which is jointly owned by De Beers Industrial and I.C.I.

Northern Aluminium Co. has announced that as from September 15 its name is changed to Alcan Industries Ltd. This new name involves no change of ownership or policy, but is made to identify the company as a member of Aluminium Ltd. of Canada, enterprises.

International Nickel Co. of Canada has announced that Mr. James A. Richardson, vice-president of James Richardson and Sons, and Mr. James H. Goss, vice-president of General Electric Co., have been elected directors of Inco.

In our issue of September 9, p. 290, owing to a typographical error, the footnote to the Final dividends expected for Rhodesian Selection read "based on an assumption of 5 per cent increase on final for previous year". This should, of course, have read "based on an assumption of 50 per cent".

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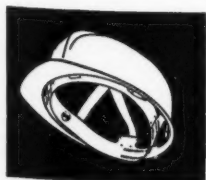
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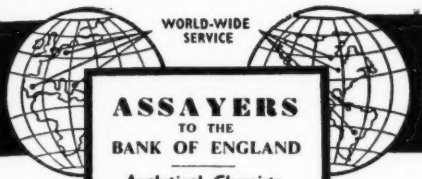
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Left: CABLE BELT rope driven conveyor. Length 7,500 feet, Lift 220 feet, 42 in. Belt at 350 ft./min. handling 600 tons/hour of R.O.M. Coal.

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Right: CABLE BELT rope driven conveyor. Length 7,260 feet, Lift 300 feet, 24 in. Belt at 200 feet/minute, handling 200 tons/hour of chalk.

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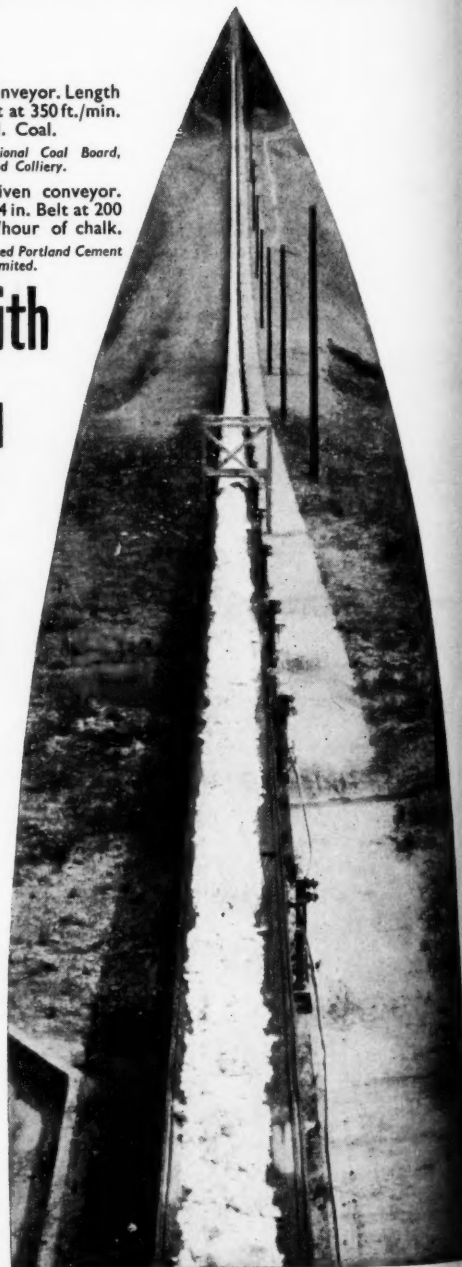
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